

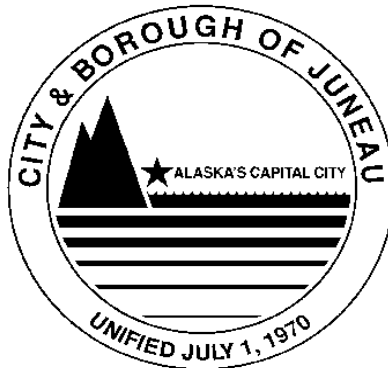
JNU RUNWAY SAFETY AREA IMPROVEMENTS, PHASE 2B

VOLUME I OF III

Contract No. BE17-045

AIP No. 3-02-0133-xxx-2016

File No. 1603



ENGINEERING DEPARTMENT

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END OF SECTION

NOTICE INVITING BID – 00 0300

OBTAINING CONTRACT DOCUMENTS. The Contract Documents are entitled:

**Runway Safety Area Improvements, Phase 2B
CBJ Contract No. BE17-045**

The Contract Documents may be obtained at the City & Borough of Juneau (CBJ) Engineering Department, 3rd Floor Marine View Center, upon payment of \$115 (non-refundable) for each set of Contract Documents (including Technical Specifications and Drawings) or may be downloaded for free at the CBJ Engineering Department webpage at: www.juneau.org/engineering

PRE-BID CONFERENCE. Prospective Bidders are encouraged to attend a Pre-Bid conference of the proposed Work, which will be conducted by the Owner and Architect, at 10:00 a.m. on August 9, 2016, in the Alaska Room, at the Juneau International Airport, 1873 Shell Simmons Drive, Juneau, AK. The object of the conference is to acquaint Bidders with the bid documents and site conditions. Conference call capability will be available for the Pre-Bid meeting. Bidders intending to participate via conference call shall notify Janet Sanbei in the CBJ Engineering Contracts Division, at (907) 586-0480, janet.sanbei@juneau.org by 4:30 p.m., August 8, 2016.

DESCRIPTION OF WORK. The project consists of drainage improvements; utility installation and relocations; geothermal loop piping and well field; aircraft tie-downs; hot mix asphalt pavement; taxiway edge lights and reflective markers; pavement marking; placement of recycled asphalt pavement; and perimeter fence.

COMPLETION OF WORK. The Work must have substantial completion by November 30, 2017. Final completion shall be 30 days following substantial completion.

DEADLINE FOR BIDS: Sealed bids must be received by the Purchasing Division **prior to 2:00 p.m., Alaska Time on August 17, 2016,** or such later time as may be announced by addendum at any time prior to the deadline. Bids will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of bids. Bids will be opened immediately thereafter in the Assembly Chambers of the Municipal Building, 155 S. Seward Street, unless otherwise specified.

Bid documents delivered in person or by courier service must be delivered to:

PHYSICAL LOCATION:

City and Borough of Juneau, Purchasing Division
105 Municipal Way, Room 300
Juneau, AK 99801

Bid documents delivered by the U.S. Postal Service must be mailed to:

MAILING ADDRESS:

City and Borough of Juneau, Purchasing Division
155 South Seward Street
Juneau, AK 99801

NOTICE INVITING BID – 00 0300

OWNER'S RIGHTS RESERVED. The Owner reserves the right to reject any or all Bids, to waive any informality in a Bid, and to make award to the lowest responsive, responsible Bidder as it may best serve the interests of the Owner.

OWNER: City and Borough of Juneau

By: _____
Greg Smith, Contract Administrator

Date

END OF SECTION

INSTRUCTIONS TO BIDDERS – 00 2113

1.0 DEFINITIONS. Terms used in these Instructions to Bidders and the Notice Inviting Bids have the meanings assigned to them in the General Conditions (00 7000). The term "Bidder" means one who submits a bid directly to the Owner, as distinct from a sub-bidder, who submits a bid to a Bidder.

2.0 INTERPRETATIONS AND ADDENDA.

A. **INTERPRETATIONS.** All questions about the meaning or intent of the Contract Documents are to be directed to the Engineering Contracts Administrator. Interpretations or clarifications considered necessary by the Engineering Contracts Administrator in response to such questions will be issued by Addendum, mailed, faxed, or delivered to all parties recorded by the Engineering Contracts Administrator, or Owner, as having received the contract documents. Questions received less than seven days prior to the deadline for bids may not be answered. Only questions answered by formal written Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. **ADDENDA.** Addenda may be issued to modify the Contract Documents as deemed advisable by the Owner. Addenda may be faxed or, if addendum format warrants, addenda may be posted to the CBJ Engineering Department website. In any event, notification of addendum issuance will be faxed to plan holders. Hard copies are available upon request. The Owner will make all reasonable attempts to ensure that all plan holders receive notification of Addenda, however, it is strongly recommended by the Owner that Bidders independently confirm the contents, number, and dates of each Addendum prior to submitting a bid.

3.0 FAIR COMPETITION. More than one bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the Owner believes that any Bidder is interested in more than one bid for the Work contemplated, all Bids in which such Bidder is interested will be rejected. If the Owner believes that collusion exists among the Bidders, all bids will be rejected.

4.0 RESPONSIBILITY OF BIDDERS. Only responsive bids from responsible Bidders will be considered. A bid submitted by a Bidder determined to be not responsible may be rejected. The Owner may find a bidder to be not responsible for any one of the following reasons, but is not limited in its responsibility analysis to the following factors:

- A. Failure to submit "evidence of competency" and "evidence of financial responsibility" to the Owner at the time of bid opening, as described in Contractors Financial Responsibility (00 4310).
- B. Evidence of bid rigging or collusion;
- C. Fraud or dishonesty in the performance of previous contracts;
- D. Record of integrity;
- E. More than one bid for the same work from an individual, firm, or corporation under the same or different name;
- F. Unsatisfactory performance on previous or current contracts;

INSTRUCTIONS TO BIDDERS – 00 2113

- G. Failure to pay, or satisfactorily settle, all bills due for labor and material on previous contracts;
- H. Uncompleted work that, in the judgment of the Owner, might hinder or prevent the bidder's prompt completion of additional work, if awarded;
- I. Failure to reimburse the Owner for monies owed on any previous contracts;
- J. Default under previous contracts;
- K. Failure to comply with any qualification requirements of the Owner; special standards for responsibility, if applicable, will be specified. These special standards establish minimum standards or experience required for a responsible Bidder on a specific contract;
- L. Engaging in any activity that constitutes a cause for debarment or suspension under the CBJ Procurement Code 53.50 or submitting a bid during a period of debarment;
- M. Lack of skill, ability, financial resources, or equipment required to perform the contract;
- N. Lack of legal capacity to contract.
- O. Bidders must be registered as required by law and in good standing for all amounts owed to the Owner per Paragraph 19.0 of this Section.
- P. Failure to submit a complete Subcontractor Report as required in Subcontractor Report (00 5100).

Nothing contained in this section deprives the Owner of its discretion in determining the lowest responsible Bidder. Before a bid is considered for award, a Bidder may be requested to submit information documenting its ability and competency to perform the Work, according to general standards of responsibility and any special standards that may apply. It is Bidder's responsibility to submit sufficient, relevant, and adequate information. Owner will make its determination of responsibility and has no obligation to request clarification or supplementary information.

5.0 NON-RESPONSIVE BIDS. Only responsive bids will be considered. Bids may be considered non-responsive and may be rejected. Some of the reasons a bid may be rejected for being non-responsive are:

- A. If a bid is received by the CBJ Purchasing Division after the deadline for bids.
- B. If the bid is on a form other than that furnished by the Owner, or legible copies thereof; or if the form is altered or any part thereof is detached; or if the bid is improperly signed.
- C. If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the bid incomplete, indefinite, ambiguous as to its meaning, or in conflict with the Owner's bid document.
- D. If the Bidder adds any unauthorized conditions, limitations, or provisions reserving the right to accept or reject any award, or to enter into a contract pursuant to an award. This does not exclude a bid limiting the maximum gross amount of awards acceptable to any

INSTRUCTIONS TO BIDDERS – 00 2113

one Bidder at any one bid opening, provided that any selection of awards will be made by the Owner.

- E. If the bid does not contain a Unit Price for each Unit Price pay item listed, except in the case of authorized alternate pay items.
- F. If the Bidder has not acknowledged receipt of each Addendum.
- G. If the Bidder fails to furnish an acceptable bid guaranty with the bid.
- H. If any of the Unit Prices bid are excessively unbalanced (either above or below the amount of a reasonable bid) to the potential detriment of the Owner.
- I. If a Bid Modification does not conform to Paragraph 13.0 of this section.
- J. If all Bidding Forms are not submitted at time of Bid.

6.0 BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE. It is the responsibility of each Bidder before submitting a bid:

- A. To examine thoroughly the Contract Documents and other related data identified in the bidding documents. This includes, but is not limited to :
 - 1. Visiting the site to become familiar with and to satisfy the Bidder as to the local and specific conditions that may affect cost, progress, or performance of the Work,
 - 2. Considering federal, state and local laws and regulations that may affect cost, progress, or performance of the Work,
 - 3. Studying and carefully correlating the Bidder's observations with the Contract Documents, and other related data; and
 - 4. Notifying the Owner of all conflicts, errors, or discrepancies in or between the Contract Documents and such other related data.
- B. To make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data that pertain to the physical conditions (surface, subsurface, and underground utilities) at or contiguous to the site or otherwise that may affect cost, progress, or performance of the Work and that the bidder deems necessary to determine its Bid for performing the Work in accordance with the time, price, and other terms and conditions of the contract documents.
- C. To request access to the project site for purposes of obtaining additional information as described above at least ten days in advance of the advertised deadline for bids. The Owner will provide access and security escort to the Bidder, who shall pay for all costs associated with such escort. The Bidder's investigations shall be limited to actions that do not require permits or authorizations from the Federal Aviation Administration or similar agencies.

The submission of a bid shall be prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the contract documents. The submission of a bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this section, "Bidder's Examination of Contract Documents and Site" herein, that without exception the Bid is premised upon performing the Work required by the Contract Documents and such means,

INSTRUCTIONS TO BIDDERS – 00 2113

methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

7.0 BIDDING FORMS

- A. The Bid (00 4113), Bid Schedule (00 4114), Bid Security (00 4313), and other documents required at the time of bid submission shall be made on forms provided in the yellow bidding packet, or on legible and complete copies thereof. The specific forms and documents required for bidding this project are described in the bidding checklist (00 4100), and included in Bid Form (00 4113).
- B. All blanks on the Bid (00 4113), Bid Schedule (00 4114), Bid Security (00 4313), and other documents required at the time of bid submission must be signed in ink with all names legibly printed or typed below the signature.
- C. Bids by corporations must be executed in the corporate name by the president, a vice-president (or other corporate officer). The corporate address and state of incorporation must appear below the signature.
- D. Bids by partnerships must be executed in the partnership name and be signed by a managing partner, and the official address of the partnership must appear below the signature.
- E. The bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the bid form. Failure to acknowledge Addenda may render bid non-responsive and may cause its rejection.
- F. The address to which communications regarding the bid are to be directed must be shown.

8.0 SUBSTITUTE OR "OR-EQUAL" ITEMS. Requests for substitution or consideration of “or equal” items is not allowed during the bid period. The procedure for the submittal of substitute or "or-equal" products during execution of the Work is specified in the technical specifications.

9.0 SUBMISSION OF BIDS. The bid shall be delivered by the time and to the place stipulated in Section 000300 - Notice Inviting Bids. It is the Bidder's sole responsibility to see that its bid is received in proper time. Oral, telegraphic, emailed, or faxed bids will not be considered. The envelope enclosing the sealed bids shall be plainly marked in the upper left-hand corner with the name and address of the Bidder and shall also include the label included in Notice Inviting Bids (00 0300). The bid security shall be enclosed in the same envelope with the bid.

10.0 BID SECURITY, BONDS, AND INSURANCE. Each bid shall be accompanied by a certified, or cashier's check, or approved Bid Bond (004313) in an amount of at least 5 percent of the total bid price. The “total bid price” is the amount of the Base Bid, plus the amount of alternate bid items, if any, that total maximum amount for which the contract could be awarded. Said check or bond shall be made payable to the Owner and shall be given as a guarantee that the Bidder, if offered the Work, will enter into an Agreement with the Owner, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said bonds, if required, and insurance amounts shall be as stated in the Supplementary General Conditions. In case of refusal or failure to enter into said Agreement, the check or Bid Bond, as the case may be, may be forfeited

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to the Owner. If the Bidder elects to furnish a Bid Bond as its bid security, the Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bid Bonds must be accompanied by a legible Power of Attorney.

11.0 RETURN OF BID SECURITY. The Owner will return all bid security checks (certified or cashier's) accompanying such of the Bids as are not considered in making the award. All other Bid securities will be held until the Agreement has been executed. Following execution of the Agreement, all other bid security checks will be returned to the respective Bidders whose bids they accompanied and bid security bonds will be appropriately discarded.

12.0 DISCREPANCIES IN BIDS. In the event there is more than one pay item in a Bid Schedule, the Bidder shall furnish a price for all pay items in the schedule, and failure to do so may render the bid non-responsive and cause its rejection. In the event there are Unit Price pay items in a Bid Schedule and the amount indicated for a Unit Price pay item does not equal the product of the Unit Price and quantity, the Unit Price shall govern and the amount will be corrected accordingly, and the Bidder shall be bound by said correction. In the event there is more than one pay item in a Bid Schedule and the total indicated for the schedule does not agree with the sum of the prices bid on the individual items, the prices bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Bidder shall be bound by said correction.

13.0 BID MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS.

- A. Any bidder may deliver a modification to a bid in person, by mail or fax (907-586-4561), provided that such modification is received by the Purchasing Division no later than the deadline for bids. Modifications will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of the modification. The modification must not reveal the bid price but should be in the form of an addition or subtraction or other modification so that the final prices will not be known until the sealed bid is opened.

The Bid modifications shall be provided on the **Bid Modification Form (00 4115)** located at the end of this section. Submittal of any other form by the vendor may deem the modification unacceptable by the Owner. **A mail or fax modification should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices will not be known by the City and Borough until the sealed bid is opened.** Submitted Modification forms shall include the modification to the unit price or lump sum amount of each pay item modified.

FAX DISCLAIMER: It is the responsibility of the bidder to submit modifications in a timely manner. Bidders' use of a fax machine to modify their bid shall be at bidders' sole risk. The Purchasing Division will attempt to keep the fax machine in good working order but will not be responsible for bid modifications that are late due to mechanical failure, a busy fax machine, or any other cause arising from bidder's use of a fax machine, even if bidder submits a transmission report or provides other confirmation indicating that the bidder transmitted a bid modification prior to the deadline. The City will not be responsible for its failure to receive the modification whether such failure is caused by equipment or human error, or otherwise. Bidders are therefore strongly encouraged to confirm receipt of their bid modification with the Purchasing Division (907-586-5258) prior to deadline.

- B. Conditioned bids, limitations, or provisos attached to the Bid or bid modification will render it unauthorized and cause its rejection as being non-responsive. The completed Bid forms shall be without interlineations, alterations, or erasures in the printed text. All

INSTRUCTIONS TO BIDDERS – 00 2113

changes shall be initialed by the person signing the Bid. Alternative Bids will not be considered unless called for.

14.0 WITHDRAWAL OF BID. Prior to the deadline for bids, the bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of bids.

15.0 AWARD OF CONTRACT.

- A. Award of a contract, if it is awarded, will be made to the lowest responsive, responsible Bidder whose bid complies with all the requirements prescribed. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the bids are to remain open. Unless otherwise indicated, a single award will be made for all the bid items in an individual Bid Schedule.
- B. If the Owner has elected to advertise this project with a Base Bid and Alternates, the Owner may elect to award the contract for the Base Bid, or the Base Bid in combination with one or more Alternates selected by the Owner. In either case, award shall be made to the responsive, responsible bidder offering the lowest total Bid for the work to be awarded.
- C. Low Bidder will be determined on the basis of the lowest total of the Base Bid plus combinations of Additive Alternates (when used) in order of priority as listed on the Bid and within the limits of available funding.

16.0 EXECUTION OF AGREEMENT.

- A. All bids of value greater than \$1,000,000 must be approved by the CBJ Assembly. After the CBJ Assembly has approved the award and after the bid protest period, the Owner will issue a Notice of Intent to Award to the approved Bidder. The Bidder to whom award is made shall execute a written Agreement with the Owner on the Agreement form supplied in these contract documents, collect insurance, and shall furnish all certificates and bonds required by the Contract Documents within 10 calendar days from the date of the Notice of Intent to Award letter.
- B. Failure or refusal to enter into the Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the Owner may award the contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the Owner may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the Owner.

17.0 LIQUIDATED DAMAGES. Provisions for liquidated damages, if any, are set forth in the Agreement.

INSTRUCTIONS TO BIDDERS – 00 2113

18.0 FILING A PROTEST.

- A. A Bidder may protest the proposed award of a competitive sealed bid by the City and Borough of Juneau. The protest shall be executed in accordance with CBJ Ordinance 53.50.062 PROTESTS and CBJ Ordinance 53.50.080 ADMINISTRATION OF PROTEST. The entire text of the CBJ Purchasing Ordinance can be accessed at the CBJ website, <http://www.juneau.org/law/code/code.php>, or call the CBJ Purchasing Division at (907) 586-5258 for a copy of the ordinance.
- B. Late protests shall not be considered by the CBJ Purchasing Officer.

19.0 CONTRACTOR'S GOOD STANDING WITH CBJ FINANCE DEPARTMENT: Contractors must be in good standing with the CBJ prior to award, and prior to any contract renewals, and in any event no later than seven business days following notification by the CBJ of intent to award. **Good standing** means: all amounts owed to the CBJ are current and the Contractor is not delinquent with respect to any taxes, fees, assessment, or other monies due and owed the CBJ, or a Confession of Judgment has been executed and the Contractor is in compliance with the terms of any stipulation associated with the Confession of Judgment, including being current as to any installment payments due; and Contractor is current in all CBJ reporting obligations (such as sales tax registration and reporting and business personal property declarations). Failure to meet these requirements may be cause for rejection of your bid. To determine if your business is in good standing, or for further information, contact the CBJ Finance Department's Sales Tax Division at (907) 586-5265 for sales tax issues, Assessor's Office at (907) 586-0930 for business personal property issues, or Collections Division at (907) 586-5268 for all other accounts.

20.0 FEDERAL CONTRACT PROVISIONS. Bidders shall comply with all applicable federal procurement and contract provisions including requirements in the Supplementary General Conditions and the following:

- A. **BUY AMERICAN PREFERENCES.** The contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder must complete and submit the Buy American certification included in section 004410 with its bid. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

- B. **CIVIL RIGHTS, TITLE VI NOTICE.** The Juneau International Airport of the City and Borough of Juneau, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.
- C. **DISADVANTAGED BUSINESS ENTERPRISES (DBE).** The Owner's award of this contract is conditioned upon Bidder satisfying the good faith effort requirements of 49 CFR

INSTRUCTIONS TO BIDDERS – 00 2113

§26.53. As a condition of bid responsiveness, the Bidder must submit the following information on the forms provided herein:

1. The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
2. A description of the work that each DBE firm will perform;
3. The dollar amount of the participation of each DBE firm listed under (1.)
4. Written statement from Bidder that attests their commitment to use the DBE firm(s) listed under (1.) to meet the Owner's project goal;
5. If Bidder cannot meet the advertised project DBE goal; evidence of good faith efforts undertaken by the Bidder as described in appendix A to 49 CFR Part 26.

The successful Bidder must provide written confirmation of participation from each of the DBE firms the Bidder lists in their commitment. This Bidder must submit the DBE's written confirmation of participation with the Subcontractor Report (00 5100).

- D. TRADE RESTRICTION CERTIFICATION.** By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror -
- a. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (U.S.T.R.);
 - b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R; and
 - c. has not entered into any subcontract for any product to be used on the Federal on the project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

This certification concerns a matter within the jurisdiction of an agency of the United States 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.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

1. who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or
2. whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or
3. who incorporates in the public works project any product of a foreign country on such U.S.T.R. list;

INSTRUCTIONS TO BIDDERS – 00 2113

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. The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by U.S.T.R, unless the Offeror has knowledge that the certification is erroneous.

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

E. NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION to ENSURE EQUAL EMPLOYMENT OPPORTUNITY.

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade: 15.1%

Goals for female participation in each trade: 6.9%

These goals are applicable to all of the contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name,

INSTRUCTIONS TO BIDDERS – 00 2113

address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

As used in this notice and in the contract resulting from this solicitation, the "covered area" is Juneau International Airport, Juneau, Alaska.

F. DEBARMENT.

CERTIFICATION OF BIDDER REGARDING DEBARMENT. By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

CERTIFICATION OF LOWER TIER CONTRACTORS REGARDING DEBARMENT. The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: www.sam.gov
2. Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.
If the FAA later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

G. CERTIFICATION REGARDING LOBBYING. The bidder certifies by signing and submitting this bid, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The Contractor shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

INSTRUCTIONS TO BIDDERS – 00 2113

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

END OF SECTION

BID – 00 4113

BID TO: THE CITY AND BOROUGH OF JUNEAU

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the Owner in the form included in the Contract Documents (as defined in Article 7 of the Agreement 00 5200) to perform the Work as specified or indicated in said Contract Documents entitled

**JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

2. Bidder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the “Notice Inviting Bids” and “Instructions to Bidders,” dealing with the disposition of the Bid Security.

3. This Bid will remain open for the period of time stated in the “Notice Inviting Bids” unless otherwise required by law. Bidder will enter into an Agreement within the time and in the manner required in the “Notice Inviting Bids” and the “Instructions to Bidders,” and will furnish insurance certificates, Payment Bond, Performance Bond, and any other documents as may be required by the Contract Documents.

4. Bidder has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules, and regulations), and the conditions affecting cost, progress or performance of the Work and has made such independent investigations as Bidder deems necessary.

5. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

6. To all the foregoing, and including all Bid Schedule and information required of Bidder contained in this Bid Form, said Bidder further agrees to complete the Work required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the total bid price(s) named in the aforementioned Bid Schedule.

7. Bidder has examined copies of all the Contract Documents including the following Addenda (receipt of all of which is hereby acknowledged by the Undersigned):

Addenda No.	Date Issued	Addenda No.	Date Issued

Give number and date of each addenda above. Failure to acknowledge receipt of all Addenda may cause the Bid to be non-responsive and may cause its rejection.

BID – 00 4113

8. TO BE CONSIDERED, ALL BIDDERS MUST COMPLETE AND INCLUDE THE FOLLOWING AT THE TIME OF THE DEADLINE FOR BIDS. CHECK OR INITIAL THE BOX FOR EACH DOCUMENT INCLUDED IN BID. MISSING DOCUMENTS WILL DEEM THIS BID NON-RESPONSIVE:

- Bid (00 4113) (includes addenda receipt statement)
- Completed Bid Schedule (00 4114)
- Bid Security (Bid Bond (00 4313), or by a certified or cashier's check as stipulated in the Notice Inviting Bids (00 0300)
- Contractor's Financial Responsibility (00 4310)
- Completed DBE Bidder's Registration Form, signed by Contractor (00 5420-7)
- Buy American Certificate (00 4410)
- Review applicable DBE regulations. (49 CFR, Part 26)

9. The Bidder has read this Bid and agrees to the conditions as stated herein by signing his/her signature in the space provided below.

Dated: _____	Bidder: _____ (Company Name)
Alaska CONTRACTOR's Business License No: _____	By: _____ (Signature)
Alaska CONTRACTOR's License No: _____	Printed Name: _____
Telephone No: _____	Title: _____
Fax No: _____	Address: _____ (Street or P.O. Box)
Email: _____	(City, State, Zip)

10. The apparent low Bidder is required to complete and submit the following documents by 4:30 p.m. on the ***fifth business day*** following the date of the Posting Notice.

- Subcontractor Report (00 5100);
- Comply with CBJ's DBE requirements (00 5420).
- Complete Utilization Report for each DBE (00 5420), if DBE goals are not achieved, the Contact Reports and Summary of Good Faith Efforts are required. (Forms are located in 00 5420);
- Completed DBE Bidder's Registration Form (00 5420-7), signed by each Subcontractor.

The apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in Subcontractor Report (00 5100), will be found to be not a responsible Bidder and may be required to forfeit the Bid security. The Owner will then consider the next lowest Bidder for award of the contract.

BID – 00 4113

11. The successful Bidder will be required to submit, within *Ten Days (calendar)* after the date of the “Notice of Intent to Award” letter, the following executed documents:

- Agreement (00 5200)
- Performance Bond (00 5300)
- Payment Bond (00 5400)
- Certificates of Insurance, (CONTRACTOR) (00 7000) and (00 8000)
- Vets4212 Federal Contractor Report (00 5430)
- EEO - 1 Certification (00 5500)
- EEO Estimated Employment Profile (00 5500)
- EEO Notice to Labor Unions, Minority/Women Organizations (00 5500)
- EEO Signature Page (00 5500)

END OF SECTION

BID SCHEDULE - 00 4114

BASE BID

PAY ITEM NO.	PAY ITEM DESCRIPTION	PAY UNIT	APPROX. QUANTITY	UNIT PRICE		AMOUNT	
				DOLLARS	CENTS	DOLLARS	CENTS
D-701a(2)	CPEP Polyethylene Corrugated Pipe, 18-inch	LF	405				
D-701a(3)	CPEP Polyethylene Corrugated Pipe, 24-inch	LF	170				
D-751a(1)	Manhole, Type I	Each	2				
D-751a(2)	Manhole, Type II	Each	1				
D-754a	Curb and Gutter	Linear Foot	235				
F-162a	8-Foot Chain-Link Fence	Linear Foot	870				
G-100a(1)	Mobilization and Demobilization	Lump Sum	All Req'd	Lump	Sum		
G-135a(1)	Construction Surveying by the Contractor	Lump Sum	All Req'd	Lump	Sum		
G-135b(1)	Extra Three Person Survey Party	Hour	14				
G-150a(1)	Equipment Rental	Hour	21				
G-300a(1)	CPM Scheduling	Lump Sum	All Req'd	Lump	Sum		
G-700a(1)	Airport Flagger	Contingent Sum	All Req'd	Contingent	Sum	10,200	00
L-100e	Taxiway Edge Light, L-861T	Each	13				
L-100h	Remove Runway and Taxiway Light	Each	1				
L-100n	Airport Sign, Type L-858	Each	1				
L-100ap	Spare Parts	Contingent Sum	All Req'd	Contingent	Sum	3,000	00
L-108a	Underground Cable #8 AWG, Copper, 5kV FAA Type "B" or "C" (as specified on Plans), L-824	Linear Foot	1,000				
L-108c	#6 Bare Copper Ground Conductor	Linear Foot	1,000				
L-110g	2-inch HDPE Conduit	Linear Foot	900				
P-152a	Unclassified Excavation	Cubic Yard	22,695				
P-154b	Subbase Course	Ton	5,295				
P-157a(1)	Erosion, Sediment and Pollution Control Administration	Lump Sum	All Req'd	Lump	Sum		
P157c(1)	Temporary Erosion, Sediment and Pollution Control	Lump Sum	All Req'd	Lump	Sum		
P-157e(1)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum	All Req'd	Contingent	Sum	25,500	00
P-157f(1)	Withholding	Contingent Sum	All Req'd	Contingent	Sum	00	00
P-160a	Excavation of Pavement	Square Yard	4,660				
P-161e	Recycled Asphalt Pavement Placement	Cubic Yard	160				

COMPANY NAME _____

BID SCHEDULE - 00 4114

PAY ITEM NO.	PAY ITEM DESCRIPTION	PAY UNIT	APPROX. QUANTITY	UNIT PRICE		AMOUNT	
				DOLLARS	CENTS	DOLLARS	CENTS
P-209b	Crushed Aggregate Base Course	Ton	5,730				
P-401a(1)	Hot Mix Asphalt Type II, Class B	Ton	4,510				
P-401b(1)	Hot Mix Asphalt Price Adjustment	Contingent Sum	All Req'd	Contingent	Sum	28,469	00
P-401c(1)	Asphalt Cement, PG 52-28	Ton	250				
P603a	Tack Coat, PG 52-28	Ton	7				
P620c	Runway and Taxiway Painting	Lump Sum	All Req'd	Lump	Sum		
P-620f	Painted Marking Removal	Lump Sum	All Req'd	Lump	Sum		
P-620h	Roadway Painting	Lump Sum	All Req'd	Lump	Sum		
P-650e(1)	Concrete Anchor, 5,000 lbs	Each	21				
P-660b	Reflective Marker, Type II	Each	7				
P-670a	Hazard Marker Barrier, Type II	Each	23				
T-901a	Seeding	Acre	0.2				
T-901c	Water for Maintenance	M-Gal	135				
T-905a	Topsoiling	Square Yard	1,005				
U-100a	Water Main	Lump Sum	All Req'd	Lump	Sum		
U-200a	Sanitary Sewer System	Lump Sum	All Req'd	Lump	Sum		
U-400b	Communications Utility Work	Lump Sum	All Req'd	Lump	Sum		
U-500b	Power Utility Work	Lump Sum	All Req'd	Lump	Sum		
U-700a	Ground Loop, Horizontal Piping	Lump Sum	All Req'd	Lump	Sum		

TOTAL BASE BID: _____

COMPANY NAME _____

BID MODIFICATION – 00 4115

BID MODIFICATION FORM

SUBMIT TO: CITY AND BOROUGH OF JUNEAU
PURCHASING DIVISION
FAX 907-586-4561

Modification Number: _____

Note: All modifications shall be made to the original bid amount(s). If more than one Modification form is submitted by any one bidder, changes from all Modification forms submitted will be combined and applied to the original bid. Changes to the modified Bid amounts will be calculated by the Owner.

PAY ITEM NO.	PAY ITEM DESCRIPTION	MODIFICATIONS TO UNIT PRICE OR LUMP SUM (indicate +/-)

Base Bid Total Increase or Decrease: \$ _____

Name of Bidder

Responsible Party Signature

Printed Name (must be an authorized signatory for Bidder)

END OF SECTION

CONTRACTOR'S FINANCIAL RESPONSIBILITY - 004310

All bidders must complete this form and submit at the time of the deadline for bids. Attach additional sheets as necessary to respond to questions.

PROJECT: JNU Runway Safety Area Improvements, Phase 2B, BE17-045.

As the General Contractor on this project, I intend to subcontract _____% of the total value of this contract.

A. EXPERIENCE

1. Have you ever failed to complete a contract due to insufficient resources?

No Yes If YES, explain:

2. Describe arrangements you have made to finance this work:

3. Have you had previous construction contracts or subcontracts with the City and Borough of Juneau?

Yes No

4. Describe your most recent or current contract, its completion date, and scope of work:

5. List below, and/or as an attachment to this questionnaire, other construction projects you have completed, dates of completion, scope of work, and total contract amount for each project completed in the past twelve months.

CONTRACTOR'S FINANCIAL RESPONSIBILITY - 004310

B. EQUIPMENT

1. Describe below the equipment you have available and intend to use for this project.

ITEM	QUANTITY	MAKE	MODEL	SIZE/CAPACITY	PRESENT MARKET VALUE

2. Do you propose to purchase any equipment for use on this project not listed on table B-1?

No Yes If YES, describe type, quantity, and approximate cost:

3. Do you propose to rent any equipment for this work not listed on table B-1?

No Yes If YES, describe type and quantity:

4. Is your bid based on firm offers for all materials necessary for this project?

Yes No If NO, please explain:

I hereby certify that the above statements are true and complete.

Contractor Signature

Name and Title of Person Signing

Signature

Date

BID BOND – 00 4313

KNOW ALL PERSONS BY THESE PRESENTS, that _____
_____ as Principal, and _____
as Surety, are held and firmly bound unto **THE CITY AND BOROUGH OF JUNEAU** hereinafter called
"Owner," in the sum of _____
_____ dollars, (not less than five percent of the total amount of the Bid) for
the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators,
successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said Owner to perform the Work required under the
Bid Schedule of the Owner's Contract Documents entitled

JNU RUNWAY SAFETY AREA IMPROVEMENTS, PHASE 2B

Contract No. BE17-045

NOW THEREFORE, if said Principal is awarded a contract by said Owner and, within the time and in
the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders" enters into a written
Agreement on the form of Agreement bound with said Contract Documents, furnishes the required certificates
of insurance, and furnishes the required Performance Bond and Payment Bond, then this obligation shall be
null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by
said Owner and Owner prevails, said Surety shall pay all costs incurred by said Owner in such suit, including a
reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this _____ day of _____, 20_____.

(SEAL) _____
(Principal)

(SEAL) _____
(Surety)

By: _____
(Signature)

By: _____
(Signature)

END OF SECTION

BUY AMERICAN CERTIFICATION – 00 4410

CERTIFICATE OF BUY AMERICAN COMPLIANCE FOR TOTAL FACILITY

As a matter of bid responsiveness, the bidder must complete, sign, date, and submit this certification statement with their proposal. The bidder must indicate how they intend to comply with 49 USC § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter “X”.

- Bidder hereby certifies that it will comply with 49 USC. 50101 by:
- a) Only installing steel and manufactured products produced in the United States; or
 - b) Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
 - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic products.
3. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- The bidder hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder with the apparent low bid agrees:

1. To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination that may result in rejection of the proposal.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
4. To furnish US domestic product for any waiver request that the FAA rejects.
5. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the “facility”. The required documentation for a type 3 waiver is:

- a) Listing of all manufactured products that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety)

BUY AMERICAN CERTIFICATION – 00 4410

- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
- c) Percentage of non-domestic component and subcomponent cost as compared to total “facility” component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

- a) Detailed cost information for total project using US domestic product
- b) Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

SUBCONTRACTOR REPORT – 00 5100

LIST OF SUBCONTRACTORS (AS 36.30.115)

The apparent low Bidder must submit a list of Subcontractors that the Bidder proposes to use in the performance of this contract on the fifth business day following the Posting Notice of Bids. If the fifth day falls on a weekend or holiday, the report is due by close of business on the next business Day following the weekend or holiday. The Subcontractor Report list must include each Subcontractor's name, address, location, evidence of valid Alaska Business License, and valid Alaska Contractor's Registration under AS 08.18. **If no Subcontractors are to be utilized in the performance of the Work, write in ink or type "NONE" on line (1) below**

<u>SUBCONTRACTOR</u>	¹ AK Contractor License No.	¹ Contact Name	Type of	Contract	✓ if
<u>ADDRESS</u>	² AK Business License No.	² Phone No.	<u>Work</u>	<u>Amount</u>	<u>DBE</u>
1. _____ _____ _____	1 _____ 2 _____	_____	_____	\$ _____	<input type="checkbox"/>
2. _____ _____ _____	1 _____ 2 _____	_____	_____	\$ _____	<input type="checkbox"/>
3. _____ _____ _____	1 _____ 2 _____	_____	_____	\$ _____	<input type="checkbox"/>
4. _____ _____ _____	1 _____ 2 _____	_____	_____	\$ _____	<input type="checkbox"/>

I certify that the above listed Alaska Business License(s) and Contractor Registration(s), if applicable, were valid at the time Bids were opened for this Project.

Contractor, Authorized Signature

Contractor, Printed Name

Company

SECTION 005100 - SUBCONTRACTOR REPORT

- A. A Bidder may replace a listed Subcontractor if the Subcontractor:
1. fails to comply with AS 08.18;
 2. files for bankruptcy or becomes insolvent;
 3. fails to execute a contract with the Bidder involving performance of the Work for which the Subcontractor was listed and the Bidder acted in good faith;
 4. fails to obtain bonding;
 5. fails to obtain insurance acceptable to the Owner;
 6. fails to perform the contract with the Bidder involving work for which the Subcontractor was listed;
 7. must be substituted in order for the Contractor to satisfy required state and federal affirmative action requirements;
 8. refuses to agree or abide with the Bidder's labor agreement; or
 9. is determined by the Owner not to be responsible.
 10. is not in "Good Standing" with the Owner as required in Article 21.0 in Instructions to Bidders (00 2113).
- B. If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of Work, the Bidder shall be considered to have agreed to perform that portion of Work without the use of a Subcontractor and to have represented the Bidder to be qualified to perform that Work.
- C. A Bidder who attempts to circumvent the requirements of this section by listing as a Subcontractor another contractor who, in turn, sublets the majority of the Work required under the contract violates this section.
- D. If a contract is awarded to a Bidder who violates this section, the Owner may:
1. cancel the contract; or
 2. after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the subcontract at issue.
- E. On the Subcontractor Report, the apparent low Bidder must list any Subcontractors anticipated to perform Work with a value of greater than one-half of one percent of the intended award amount, or \$2,000, whichever is less.
- F. An apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in this section may be found to be not a responsible Bidder and may be required to forfeit the Bid security. The Owner will then consider the next lowest Bidder for award of the contract.

END OF SECTION

AGREEMENT – 00 5200

THIS AGREEMENT is between THE CITY AND BOROUGH OF JUNEAU (hereinafter called Owner) and _____ (hereinafter called Contractor) Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

Contractor shall complete the Work as specified or as indicated under the Bid Schedule of the Owner's Contract Documents **Contract No. BE17-045, named JNU Runway Safety Area Improvements, Phase 2B.**

The Work is generally described as follows: The project consists of drainage improvements; utility installation and relocations; geothermal loop piping and well field; aircraft tie-downs; hot mix asphalt pavement; taxiway edge lights and reflective markers; pavement marking; placement of recycled asphalt pavement; and perimeter fence, and miscellaneous related Work.

The Work to be paid under this contract shall include the following: Total Bid as shown in Section 00 4114 - Bid Schedule.

ARTICLE 2. CONTRACT COMPLETION TIME.

The Work must have substantial completion by November 30, 2017. Final completion shall be 30 days following substantial completion.

ARTICLE 3. DATE OF AGREEMENT

The date of this agreement will be the date of the last signature on page three of this section.

ARTICLE 4. LIQUIDATED DAMAGES.

Owner and the Contractor recognize that time is of the essence of this Agreement and that the Owner will suffer financial loss if the Work is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 8 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual damages suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, the Owner and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the Owner **\$1,500** for each Day that expires after the completion time(s) specified in Article 2 herein. The amount of liquidated damages specified above is agreed to be a reasonable estimate based on all facts known as of the date of this Agreement.

ARTICLE 5. CONTRACT PRICE.

Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule. The Contractor agrees to accept as full and complete payment for all Work to be done in this contract for: **CBJ Contract No. BE17-045, named JNU Runway Safety Area Improvements, Phase 2B,** those Unit Price amounts as set forth in the Bid Schedule in the Contract Documents for this Project.

The total amount of this contract shall be _____ (\$ _____), except as adjusted in accordance with the provisions of the Contract Documents.

AGREEMENT – 00 5200

ARTICLE 6. PAYMENT PROCEDURES.

Contractor shall submit Applications for Payment in accordance with Article 9 of the General Conditions. Applications for Payment will be processed by the Architect as provided in the General Conditions.

Progress payments will be paid in full in accordance with Article 9 of the General Conditions until ninety (90) percent of the Contract Price has been paid. The remaining ten (10) percent of the Contract Price may be retained, in accordance with applicable Alaska State Statutes, until final inspection, completion, and acceptance of the Project by the Owner.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between Owner and Contractor concerning the Work consist of this Agreement (pages 00 5200-1 to 00 5200-6, inclusive) and the following sections of the Contract Documents:

- Table of Contents (pages 00 0005-1 to 00 0005-2, inclusive).
- Notice Inviting Bids (pages 00 0300-1 to 00 0300-3, inclusive).
- Instructions to Bidders (pages 00 2113-1 to 00 2113-11, inclusive).
- Bid (pages 00 4113-1 to 00 4113-2, inclusive).
- Bid Schedule (pages 00 4114-1, inclusive).
- Bid Modification (pages 00 4115-1, inclusive).
- Contractor's Financial Responsibility (pages 00 4310-1 to 00 4310-2, inclusive).
- Bid Bond (page 00 4313-1, inclusive) or Bid Security.
- Buy American (pages 00 4410-1 to 0 04410-2, inclusive).
- Subcontractor Report (pages 00 5100-1 to 00 5100-2, inclusive).
- Insurance Certificate(s).
- Performance Bond (pages 00 5300-1 to 00 5300-2, inclusive).
- Payment Bond (pages 00 5400-1 to 00 5400-2, inclusive).
- DBE and EEO Documents (Sections 00 5420 to 00 5440, inclusive).
- Veteran's Participation – Vets 4212 Form (pages 00 5430-1 to 00 5430-5, inclusive).
- Federal EEO Bid Conditions (pages 00 5500-1 to 00 5500-11, inclusive).
- Federal Labor Standards, Reporting, and Prevailing
Wage Rate Determination (page 00 5600-1, inclusive).
- Employment Security Tax Form (page 00 6100-1, inclusive).
- Completion Certificate and Release Form (pages 00 6200-1, inclusive).
- General Conditions (pages 00 7000-1 to 00 7000-36, inclusive).
- Supplementary General Conditions (pages 00 8000-1 to 00 8000-15, inclusive).
- Technical Specifications as listed in the Table of Contents.
- Drawings consisting of 24 sheets, as listed in the Table of Contents.
- Addenda numbers _____ to _____, inclusive.
- Change Orders which may be delivered or issued after the Date of the Agreement and which are not attached hereto.

There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.3 of the General Conditions.

AGREEMENT – 00 5200

ARTICLE 8. MISCELLANEOUS.

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents. This Agreement shall be governed by the laws of the State of Alaska. Jurisdiction shall be in the State of Alaska, First Judicial District.

IN WITNESS WHEREOF, Owner and Contractor have caused this Agreement to be executed on the date listed below signed by Owner.

OWNER:

CONTRACTOR:

_____ City and Borough of Juneau

(Company Name)

(Signature)

(Signature)

By: Duncan Rorie Watt, City & Borough Manager
(Printed Name)

By: _____
(Printed Name, Authority or Title)

Date: _____

Date: _____

(Contractor Signature Date)

Owner's address for giving notices:

Contractor's address for giving notices:

_____ 155 South Seward Street

_____ Juneau, Alaska 99801

_____ 907-586-0873 907-586-4530
(Telephone) (Fax)

_____ (Telephone) (Fax)

_____ (E-mail address)

Contractor License No. _____

AGREEMENT – 00 5200

**CERTIFICATE
(if Corporation)**

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the
_____ a corporation existing under the laws of
the State of _____, held on _____, 20____, the following resolution
was duly passed and adopted:

“RESOLVED, that _____, as _____ President
of the Corporation, be and is hereby authorized to **execute the Agreement** with the CITY AND
BOROUGH OF JUNEAU and this corporation and that the execution thereof, attested by the
Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed
of this Corporation.”

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the
corporation this _____ day of _____, 20_____.

Secretary

(SEAL)

AGREEMENT – 00 5200

**CERTIFICATE
(if Partnership)**

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Partners of the
_____ a partnership existing under the laws of the State
of _____, held on _____, 20____, the following resolution was duly
passed and adopted:

"RESOLVED, that _____, as _____ of the Partnership, be and is
hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and
this partnership and that the execution thereof, attested by the _____ shall be
the official act and deed of this Partnership."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____,
20_____.

Secretary

(SEAL)

AGREEMENT – 00 5200

**CERTIFICATE
(if Joint Venture)**

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Principals of the

_____ a joint venture existing under the laws of the

State of _____, held on _____, 20____, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Joint Venture, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this joint venture and that the execution thereof, attested by the _____ shall be the official act and deed of this Joint Venture."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20____.

Secretary

(SEAL)

END OF SECTION

PERFORMANCE BOND – 00 5300

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____
(Corporation, Partnership, Individual)

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____ hereinafter called the "Surety", are held and firmly bound to the CITY AND BOROUGH of JUNEAU, ALASKA hereinafter called "Owner", for the penal sum
(Owner) (City and State)

of _____ dollars (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Contractor has entered into a certain contract with the Owner, the effective date of which is (CBJ Contracts Office to fill in effective date) _____, a copy of which is hereto attached and made a part hereof for the construction of:

**JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

NOW, THEREFORE, if the Principal shall truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof, which may be granted by the Owner, with or without notice to the Surety, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

PERFORMANCE BOND – 00 5300

**JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: _____
(Signature)

(Printed Name)

(Company Name)

(Mailing Address)

(City, State, Zip Code)

SURETY:

By: _____
(Signature of Attorney-in-Fact)

Date Issued: _____

(Printed Name)

(Company Name)

(Mailing Address)

(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If Contractor is Partnership, all Partners must execute bond.

PAYMENT BOND – 00 5400

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of Contractor)

_____ a _____
(Corporation, Partnership, Individual)

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____ hereinafter called the "Surety," are held and
firmly bound to the CITY AND BOROUGH of JUNEAU, ALASKA hereinafter called "Owner," for the
(Owner) (City and State)

penal sum of _____ Dollars
(\$ _____) in lawful money of the United States, for the payment of which sum well
and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and
severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Contractor has entered into a
certain contract with the Owner, the effective date of which is (CBJ Contracts Office to fill in effective date)
_____, a copy of which is hereto attached and made a part hereof for the construction
of:

**JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms,
Subcontractors, and corporations furnishing materials for, or performing labor in the prosecution of the Work
provided for in such contract, and any authorized extension or modification thereof, including all amounts due
for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or
used in connection with the construction of such Work, and all insurance premiums on said work, and for all
labor performed in such Work, whether by Subcontractor or otherwise, then this obligation shall be void;
otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no
change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed
thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and
it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the
contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Principal shall abridge
the right of any beneficiary hereunder, whose claim may be unsatisfied.

PAYMENT BOND – 00 5400

**JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: _____
(Signature)

(Printed Name)

(Company Name)

(Mailing Address)

(City, State, Zip Code)

SURETY:

By: _____
(Signature of Attorney-in-Fact)

Date Issued: _____

(Printed Name)

(Company Name)

(Mailing Address)

(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If Contractor is Partnership, all Partners must execute bond.

DBE GOALS – 00 5420

Projects receiving Federal Grants will require Contractors to comply with the following Disadvantaged Business Enterprise Program. Section 005420 is attached and requirements are outlined herein.

Enclosed Forms:

- Disadvantaged Business Enterprises Bidder's Registration Form
- Disadvantaged Business Enterprise Utilization Report
- Contact Report
- Summary of Good Faith Effort Documentation
- Federal Contractor Veterans' Employment Report Vets4212
- Federal EEO Bid Conditions EEO-1 Certification
- Equal Employment Opportunity (EEO) Estimated Employment Profile
- Equal Employment Opportunity (EEO) Notice to Labor Unions
- Equal Employment Opportunity (EEO) Signature Page
- Equal Employment Opportunity (EEO) Weekly Payroll Report
- Quarterly Summary of Disadvantaged Business Enterprise Participation

DBE GOALS – 00 5420

Disadvantaged Business Enterprise (DBE) Requirements

This information will assist you in meeting the CBJ's Disadvantaged Business Enterprise (DBE) requirements. For simplicity, many of the regulations have been paraphrased; however, the actual laws apply and are incorporated by reference.

The CBJ shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any USDOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR part 26. CBJ shall take all necessary and reasonable steps under 49 CFR part 26 to ensure nondiscrimination in the award and administration of USDOT-assisted contracts.

The CBJ's DBE program, as required by 49 CFR part 26 and as approved by USDOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the CBJ of its failure to carry out its approved program, USDOT may impose sanctions as provided for under part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq.).

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. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the recipient deems appropriate.

The Contractor agrees to pay each Subcontractor under this Contract for satisfactory performance of its contract no later than 8 days from the receipt of each payment the Contractor receives from the CBJ. Payment shall not be delayed or withheld from any Subcontractor without prior written approval from the CBJ Project Manager. The Contractor agrees further to return retainage payments to each Subcontractor within 8 days after the Subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of Owner. This clause applies to both DBE and non-DBE Subcontractors.

The Contractor agrees to comply with AS 36.90.210.

General Requirements. For your Bid to be considered or your Contract approved, all Bidders, Contractors, and Subcontractors must:

- complete the Bidder's Registration Form for the Contractor (*this is due with bidding forms*)
- comply with the CBJ's DBE requirements;
- review applicable regulations, (49CFR Part 26);
- use good faith efforts in soliciting and achieving DBE participation.

Summary of Goals. At least 2.5% of the value of this contract must go to Disadvantaged Business Enterprises.

For assistance with DBE requirements, contact the Contract Administrator (907)586-0873. The office is located in the Engineering Department of the City and Borough of Juneau, 155 South Seward Street, Juneau, Alaska 99801, FAX: (907) 586-4530.

DBE GOALS – 00 5420

A. Who is eligible as a DBE? To qualify as a DBE, the firm must meet the federal eligibility requirements of 49 CFR 26. This means the firm must be **small, independent and at least 51% owned by minorities, women, or disadvantaged persons. The qualifying owner must control the business enterprise's day-to-day operations.**

The proposed DBE must be certified by the State of Alaska DOT&PF at the time of the bid opening

The DBE may act as a prime Contractor, Subcontractor, joint venture partner, or supplier. To be counted toward a goal the DBE must perform a commercially useful function (see D of this section).

B. DBE % Goals. To calculate the minimum dollar value for DBE participation, multiply the total contract bid price (including additives or alternates, if any) by the goal percentage.

C. How to obtain DBE participation. Prior to the scheduled pre-bid conference, solicit DBE participation to meet the goal, even if your firm is capable of doing all the work. Prior to bid opening, you must meet the goal or prove good faith efforts to meet the DBE goal. Good faith efforts include, but are not limited to the following:

- Advertise subcontracting opportunities in newspapers, trade publications and minority-focus media. Contact local minority organizations and other agencies that recruit and place DBEs.
- Review and use the directories of certified DBEs available from the State of Alaska Department of Transportation and Public Facilities Civil Rights Office. Contact them at (800) 770-6236.
- Solicit DBEs in Juneau, Southeast Alaska, Alaska, and if necessary in the Pacific Northwest and other areas. You are encouraged to use Juneau-area DBE firms when possible. DBEs must be an Alaska Certified DBE.
- Contact specific DBEs in writing, giving enough time for effective participation. Follow-up initial contacts. Execute subcontracts in a timely manner.
- Break down contracts into units that allow DBE participation and will increase your ability to meet the goals. This may include portions of work normally reserved for your firm.
- Negotiate in good faith with DBEs for specific sub-bids. Do not reject them as unqualified without a thorough investigation of their capabilities. Bids by DBEs must only be **reasonable**, not low. A reasonable price is one that would be accepted if it were the only offer.
- Either waive the requirements or help DBEs to obtain bonding, credit lines or insurance.
- Provide DBEs with information about the plans, specifications and requirements of the contract.
- Attend the pre-bid conference to review DBE and EEO requirements.

D. How to count DBE participation. The goal for DBE participation must be met, even if you can perform the entire contract. If your firm is a DBE, you will be credited for that portion of the contract for which you perform a commercially useful function and that portion subcontracted to other disadvantaged firms. For example, if a DBE prime Contractor proposes to perform 60% of a Project quoted at \$500,000.00 and subcontracts 20% to a majority firm and 20% for another DBE, participation will be 80% for DBEs in the project (60 + 20) or \$400,000.00.

DBE GOALS – 00 5420

Joint Venture. You may submit a joint venture bid with a DBE for the construction services required in the plans and specifications. The DBE partner must already be certified by the ADOT&PF. The portion of the total dollar value of a contract equal to the percentage of the ownership, control and performance of work by the DBE partner in the joint venture agreement will count toward goal attainment. Where the percentage differs for these three elements, participation shall be measured by the percentage of work performed by the DBE partner. For example, if a joint venture proposes to perform 100% of a project quoted at \$500,000, and 40% of the work is performed by the DBE partner, participation will be credited as 40% of the work or \$200,000. Another typical example would be the same joint venture proposing to perform 80% of a project quoted at \$500,000, and 20% of the ownership, control, and work performance by the DBE partner in the joint venture, with the remaining 20% of the contract performed by another majority firm; so that DBE participation would be credited at \$80,000 or 16% of the total contract work.

Negotiated or Competitively Bid Subcontracts. You must solicit DBE participation for meaningful portions of the work. You may use the competitive bid method for DBE participation, however, do not rely solely on this process to utilize disadvantaged firms. You may also negotiate for DBE participation, keeping in mind that DBE bids need only be reasonable to be considered. If the goal is not met, the City evaluates the low bidder's good faith efforts. Typically, the value of subcontracts with DBEs count 100% towards goals, (see below).

Regular Dealers or Suppliers and Manufacturers. You may count 60% of the cost to a DBE supplier (or regular dealer) who performs a commercially useful function in the supply process. If the supplier is also a manufacturer, or substantially alters the goods before resale, you may count 100% of the cost. Brokers and packagers shall not be regarded as manufacturers, regular dealers, or suppliers.

- A manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Contractor.
- A supplier (or regular dealer) is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. To be a supplier, the firm must engage in, as its principal business, and in its own name, the purchase and sale of the products in question. A supplier in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns or operates distribution equipment.

Other DBE Services. The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer of or a regular dealer in the materials or supplies, provided that the fee is determined by the Owner to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Substitution. A DBE Subcontractor may only be replaced for failure to perform. You must make a good faith effort to use another certified DBE. You must get the City Engineer's written approval before replacement.

Commercially Useful Function. The DBE must perform a commercially useful function. This means the DBE is responsible for execution of a distinct element of the work of a contract and carrying out its responsibilities by actually performing, managing, and supervising the work involved. The DBE may not, without prior approval: subcontract out portions of its work, act as an employee of another Contractor on the project, or allow another Contractor to coordinate its paperwork, employees, supplies, equipment, etc.

DBE GOALS – 00 5420

Both the DBE and the Contractor involved may be liable, if the DBE is not used as an independent Contractor, or their role results in artificially inflated goal attainment.

E. GOOD FAITH EFFORTS (GFE).

- a. **Good Faith Effort Criteria.** When a bidder fails to meet DBE Utilization Goals, the Contract Administrator will use the following criteria to judge whether they have demonstrated sufficient Good Faith Effort to be eligible for award of the contract.

- (1) **Consider All Subcontractable Items.** The bidder shall seek DBE participation for subcontractable items
- (2) **Initial DBE Notification.** All DBEs listed in the Department's current DBE Directory that have a "Yes" under Required GFE Contact and "Yes" under the specific Work Area (Region) must be contacted at least seven calendar days prior to bid opening. Each contact with a DBE firm will be logged on a Contact Report.

The bidder must give DBEs at least five calendar 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.

The only acceptable methods of initial and follow up notification are:

- (a) By fax with a confirmation receipt of successful transmission to the DBEs fax number listed in the DBE Directory. A fax transmission without receipt of successful transmission is unsatisfactory.
 - (b) By email with confirmation of successful receipt by DBEs email address listed in the DBE Directory. Email without confirmation of successful receipt is unsatisfactory.
 - (c) By U.S. Mail to the DBEs address listed in the DBE Directory with a return receipt requested. Letters mailed without a return receipt signed by the DBE or DBE Key employee are unsatisfactory. Delivery confirmation with evidence of successful delivery is an acceptable substitute for Return Receipt.
 - (d) By telephone solicitation with a record of the date and time of the telephone call made to the DBEs telephone number listed in the DBE Directory. Telephone solicitation without a record of date and time is unsatisfactory.
- (3) **Non-Competitive DBE Quotes.** DBE quotes more than 10 percent higher than an accepted non-DBE quote will be deemed non-competitive, provided they are for the exact same work or service.

All evidence in support of a non-competitive bid determination must be provided at the time of the Good Faith Effort submittal. When a DBE quote is rejected as being non-competitive, the work must be performed by the non-DBE subcontractor whose quote was used to provide the basis of the determination. Payments received by the non-DBE subcontractor during the execution of the Contract shall be consistent with the accepted quote. This does not preclude increases due to change documents issued by the Owner.

- (4) **Assistance to DBEs.** Contractors must provide DBEs with:

- (a) Information about bonding or insurance required by the bidder.

DBE GOALS – 00 5420

- (b) Information about securing equipment, supplies, materials, or related assistance or services.
- (c) Adequate information about the requirements of the contract regarding the specific item of work or service sought from the DBE.
- (5) Follow-up DBE Notifications.** Contact the DBEs to determine if they will be bidding. Failure to submit a bid by the deadline is evidence of the DBE's lack of interest in bidding. Documentation of follow-up contacts shall be logged on the Contact Report.
- (6) Good Faith Effort Evaluation.** Subsections (1) through (5) must be completed for a Good Faith Effort based submission to be considered. Failure to perform and document actions contained in subsections (1) through (5) constitutes insufficient Good Faith Effort. After submitting a Good Faith Effort, bidders may only clarify efforts taken before opening. No new efforts or additional DBE participation is permitted after opening.

If the bidder cannot demonstrate the ability to meet the DBE Utilization Goal, and cannot document the minimum required Good Faith Effort (as specified below), the Contracting Officer will determine the bidder to be not responsible.

- b. Administrative Reconsideration.** 49 CFR Part 26.53(d) provides an opportunity for administrative reconsideration when the Contract Administrator determines that Good Faith Effort is insufficient. This opportunity must be exercised within three working days of notification that Good Faith Efforts were unsatisfactory. For reconsideration, the bidder must provide written documentation or argument concerning efforts to meet the DBE Utilization Goal. No new or additional contact information may be provided. Only contact information the bidder provided in support of its initial request for a Good Faith Effort determination by the Contract Administrator may be presented to support the request for administrative reconsideration.

The process for an Administrative Reconsideration is as follows:

- (1) The bidder will have the opportunity to meet with the DBE Liaison Officer in person to discuss the issue. If so desired, the bidder must be ready to meet with the DBE Liaison Officer within four working days of receipt of notice that it failed to meet the requirements of this subsection.
- (2) The DBE Liaison Officer will render a written decision and provide notification to the bidder within four working days after the meeting. The written decision will explain the basis for finding.
- (3) The finding of the DBE Liaison Officer cannot be appealed to the U.S. DOT.

CITY AND BOROUGH OF JUNEAU

DISADVANTAGED BUSINESS ENTERPRISE BIDDER REGISTRATION FORM

Federal-Aid Contracts

JNU Runway Safety Area Improvements, Phase 2B

BE17-045

All firms submitting bids or quotes on City and Borough of Juneau/Juneau International Airport projects must register annually. Complete this form for each contractor and subcontractor.

Name of Firm: _____

Street Address: _____

Mailing Address: _____

Telephone Number: _____ Fax number: _____

E-mail Address: _____ Date Firm was Established: _____

Is this firm a (check all that apply):

- | | | | |
|--------------------------|---------|--------|--|
| Prime Contractor? | [] Yes | [] No | |
| Subcontractor? | [] Yes | [] No | Identify specialty: _____ |
| Service Provider? | [] Yes | [] No | Identify service: _____ |
| Material Supplier? | [] Yes | [] No | Identify material: _____ |
| Manufacturer? | [] Yes | [] No | Identify product: _____ |
| Certified DBE? | [] Yes | [] No | If so, by whom?
[] DOT&PF |
| Certified Small Business | [] Yes | [] No | If so, please include a copy of the SBA Certificate. |

Type of contracts/proposals bid by the firm:

- [] Highways [] Airports [] Mass Transit
- [] Other (specify) _____

Firm's gross annual receipts:

- [] <\$500,000
- [] \$500,000 - \$999,999
- [] \$1,000,000 - \$4,999,999
- [] \$5,000,000 - \$9,999,999
- [] \$10,000,000 - \$16,999,999
- [] > \$17,000,000

Send this completed form to:
City and Borough of Juneau
Engineering Dept., Contract Administrator
155 South Seward Street
Juneau, Alaska 99801

If you have any questions, please call (907) 586-0873.

CITY AND BOROUGH OF JUNEAU

**DISADVANTAGED BUSINESS ENTERPRISE
UTILIZATION REPORT**

Federal-Aid Contracts

JNU Runway Safety Area Improvements, Phase 2B

BE17-045

The undersigned hereby certifies on behalf of the bidder that:

- A. It [] is [] is not a DOT&PF certified DBE or DBE joint venture.
- B. It [] has [] has not met the DBE Goal for the project. If it has not met the goal, the required documentation of sufficient good faith efforts [] is [] is not attached hereto.
- C. Listed below are the **certified** DBEs to be used in meeting the DBE goal. Included are the firm name, telephone number, bid items or portions of work to be performed indicated by item number, type of DBE credit claimed [prime contractor (P), joint venture (JV), subcontractor (sub), regular dealer (rd), broker (b), or manufacturer (m)], and the creditable¹ dollar amount to be counted toward the goal.

FIRM NAME	PHONE #	BID ITEM, WORK, OR PRODUCT ²	TYPE OF CREDIT	CREDITABLE DOLLAR AMOUNT
				\$
				\$
				\$
				\$
				\$
				\$

Total creditable DBE Utilization Amount ³	\$ _____
Basic Bid Amount	\$ _____
DBE Utilization as % of Basic Bid Amount	_____ %
Original DBE Project Goal	_____ %
Revised DBE Project Goal	\$ _____

Signature of Authorized Company Representative

Title

Company Name

Company Address (Street or PO Box, City, State, Zip)

()

Date

Phone Number

1. See DBE Specification (Section 004420 - DBE Goals) for determining type and amount of credit claimed for contract award.
2. Identify specific pay item, product, or component of work to be performed by DBE.
3. If accepted, this amount becomes the Revised DBE Goal and the required minimum level of DBE participation during the life of the contract.

CITY AND BOROUGH OF JUNEAU

CONTACT REPORT

US DOT Federal-Aid Contracts

JNU Runway Safety Area Improvements, Phase 2B

BE17-045

Specific Work or Materials (by pay Item): _____

DBE Firm Contacted:

_____	_____	()
Name	Address	Phone Number

A. INITIAL CONTACT: (See important contact information on instruction sheet)

Method: [] Phone [] Mail [] FAX [] Other

1. Date _____

2. Person Contacted _____

Name _____ Title _____

3. DBE's Response: Date: _____ Method: [] Phone [] Mail [] FAX [] Other

[] Submitted an acceptable sub-bid. (If sub-bid accepted, skip to Section D)

[] Not interested: Indicate Reason(s) _____

[] Needs more information: Date Prime provided requested information _____

[] Will provide quote by: Date _____

[] Received unacceptable sub-bid (complete Section C)

B. FOLLOW-UP CONTACT

Method: [] Phone [] Mail [] FAX [] Other

1. Date _____

2. Person Contacted _____

Name _____ Title _____

3. DBE's Response: Date: _____ Method: [] Phone [] Mail [] FAX [] Other

[] Submitted an acceptable sub-bid. (If sub-bid accepted, skip to Section D)

[] Received unacceptable sub-bid (complete Section C)

[] Other result: _____

C. EXPLANATION OF FAILURE TO ACHIEVE AN ACCEPTABLE SUB-BID:

1. Were the following required efforts made?

a. [] Yes [] No Identified specific items of work, products, materials, etc. when asking for quote(s).

b. [] Yes [] No Offered assistance in acquiring necessary bonding & insurance.

c. [] Yes [] No Provided all appropriate information concerning the specific work items or materials.

2. Was the DBE's quote non-competitive (i.e., more than 10% higher than the accepted quote)? [] Yes [] No

3. Was the DBE unable to perform in some capacity? [] Yes [] No If "Yes", explain: _____

D. CERTIFICATION: I certify that the information provided above is accurate and that efforts to solicit sub-bids were made in good faith.

_____	_____	_____
Signature of Company Representative	Title	Date

_____	_____	_____
Name of DOT&PF Reviewer	Title	Date

INSTRUCTIONS

Project Name and Number: Enter Project name and number as they appear on bid documents.

Work or Materials: Identify the specific work item or material that you requested this firm to furnish.

Firm Contacted: Enter name of firm as it appears in the current AK DOT&PF DBE directory.

Address: Enter address of firm contacted. **Phone Number:** Enter phone number of firm contacted.

A. INITIAL CONTACT (Must be made at least seven calendar days prior to bid opening.)

1. **Date and Method of Initial Contact:** Indicate the method and date that actual contact was made or the date correspondence was postmarked. Leaving a "please call me" message does not constitute a contact. Attach a copy of dated letter or fax.
2. **Name and Title of Person Contacted.** Enter name and title of company representative with whom you corresponded or discussed submitting a sub-bid.
3. **DBE's Response:** Indicate one or more of the responses listed. If a firm bid was received and accepted, skip to section D.

B. FOLLOW-UP CONTACT

If no response or an inconclusive response was received from the initial contact, a follow-up contact is required to determine for a certainty that the firm does not intend to submit a sub-bid or to conclude discussions with a sub-bid submittal.

1. **Date and Method of Follow-up Contact:** Indicate the method and date that actual contact was made or the date correspondence was postmarked. Leaving a "please call me" message does not constitute a contact. Attach a copy of dated letter or fax.
2. **Name and Title of Person Contacted.** Enter name and title of company representative with whom you corresponded or discussed submitting a sub-bid.
3. **DBE's Response:** Indicate one or more of the responses listed. If a firm bid was received and accepted, skip to section D.

C. EXPLANATION OF FAILURE TO ACHIEVE AN ACCEPTABLE SUB-BID

1. A NO response to items 1a., b., or c. will result in rejection of this contact. Be specific on results of discussions.
2. A YES answer to item 2. is grounds for rejecting a DBE sub-bid.
3. A YES answer to item 3. is grounds for rejecting a DBE sub-bid, only if the inability to perform is in an area of work specifically identified as a sub-item under the applicable bid item.

D. CERTIFICATION

This certification of accuracy and good faith by the Contractor will be verified by contact with the listed firm. Falsification of information on the DBE Contact Report is grounds for debarment action under AS 36.30.640(4).

CITY AND BOROUGH OF JUNEAU

SUMMARY OF GOOD FAITH EFFORT DOCUMENTATION
US DOT Federal-Aid Contracts

JNU Runway Safety Area Improvements, Phase 2B
BE17-045

Contractor: _____

List **all** items considered for DBE utilization.

a. MATERIAL OR SPECIFIC ITEM OF WORK (SPECIFY PAY ITEM)	b. ACCEPTABLE DBE QUOTE RECEIVED ¹	c. # OF DBEs CONTACTED IN DBE DIRECTORY	d. # OF DBEs THAT RESPONDED ²	e. # OF DBE QUOTES RECEIVED
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

- 1. Check if acceptable DBE quote was received (if so, skip c, d, and e)
- 2. Attach completed Contact Reports

LIST ADDITIONAL ITEMS ON REVERSE SIDE

a. MATERIAL OR SPECIFIC ITEM OF WORK (SPECIFY PAY ITEM)	b. ACCEPTABLE DBE QUOTE RECEIVED ¹	c. # OF DBES CONTACTED IN DBE DIRECTORY	d. # OF DBES THAT RESPONDED ²	e. # OF DBE QUOTES RECEIVED
9.				
10.				
11.				
12.				
13.				
14.				
15.				
1. Check if acceptable DBE quote was received (if so, skip c, d, and e) 2. Attach completed Contact Reports				
Comments:				



DBE GOALS – 00 5420

CITY & BOROUGH OF JUNEAU, ENGINEERING DEPARTMENT

**QUARTERLY SUMMARY OF
DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION**
Federal-Aid Contracts

Project Name and Number: JNU Runway Safety Area Improvements, Phase 2B – BE17-045

Contractor: _____

Report for: Month _____ Year _____

Prime is a DBE? Yes No

SUBCONTRACTORS

Firm Name	Work Performed	Amount Paid This Month	Total Payment to Date	Final Payment Yes/No
		\$	\$	

Subtotal: \$ _____

MANUFACTURERS

Firm Name	Product Manufactured	Amount Paid This Month	Total Payment to Date	Final Payment Yes/No
		\$	\$	

Subtotal: \$ _____

DBE GOALS – 00 5420

BROKERS

Firm Name	Product/Service Brokered	Amount Paid This Month	Total Payment to Date	Final Payment Yes/No
		\$	\$	

Subtotal: \$ _____

5% of Subtotal: \$ _____

REGULAR DEALERS

Firm Name	Materials Supplied	Amount Paid This Month	Total Payment to Date	Final Payment Yes/No
		\$	\$	

Subtotal: \$ _____

60% of Subtotal: \$ _____

The undersigned swears that the information they are providing to the City & Borough of Juneau, Engineering Department is accurate and complete to the best of their knowledge.

Further, the undersigned authorizes the City & Borough of Juneau, Engineering Department to verify the accuracy of the information provided.

Please note that the City & Borough of Juneau, Engineering Department is required to report to the Department of Transportation any false, fraudulent, or dishonest conduct in connection with the program, so that DOT can take the steps (e.g., referral to the Department of Justice for criminal prosecution, referral to the DOT Inspector General, action under suspension and debarment or Program Fraud and Civil Penalties rules) provided in §26.109. The City & Borough of Juneau, Engineering Department, will consider similar action under our own legal authorities, including responsibility determinations in future contracts.

Signature & Title of Company Representative Date

FEDERAL VETS 4212 - 00 5430

FEDERAL CONTRACTOR VETERANS' EMPLOYMENT REPORT VETS-4212

OMB NO: 1293-0005

Expires: 11/30/2017

Persons are not required to respond to this collection of information unless it displays a valid OMB number. It is mandatory for a covered Federal contractor respond to this information collection. See 38 U.S.C. § 4212(d) and "Who Must File" section of instructions.

RETURN COMPLETED REPORT TO:

VETS-4212 Submission
 VETERANS' EMPLOYMENT AND TRAINING SERVICE (VETS)
 Service Center

In care of: Department of Labor National Contact Center (DOL-NCC)
 15000 Conference Center Drive, Suite B0132
 Chantilly, VA 20151

ATTN: Human Resource/EEO Department

TYPE OF REPORTING ORGANIZATION (Check one or both, as applicable) <input type="checkbox"/> Prime Contractor <input type="checkbox"/> Subcontractor	TYPE OF FORM (Check only one) <input type="checkbox"/> Single Establishment <input type="checkbox"/> Multiple Establishment-Headquarters <input type="checkbox"/> Multiple Establishment-Hiring Location <input type="checkbox"/> Multiple Establishment-State Consolidated (specify number of locations) (MSC)
--	---

COMPANY IDENTIFICATION INFORMATION (Omit items preprinted above-ADD Company Contact Information Below)

COMPANY No:		TWELVE MONTH PERIOD ENDING		2	0	1	5
				M	M	D	D
NAME OF PARENT COMPANY:		ADDRESS (NUMBER AND STREET):					
CITY:		COUNTY:		STATE:		ZIP CODE:	
NAME OF COMPANY CONTACT:		TELEPHONE FOR CONTACT:			EMAIL:		

NAME OF HIRING LOCATION:		ADDRESS (NUMBER AND STREET):					
CITY:		COUNTY:		STATE:		ZIP CODE:	

NAICS:											DUNS:	-		-								EMPLOYER ID (IRS TAX No.)	-									
--------	--	--	--	--	--	--	--	--	--	--	-------	---	--	---	--	--	--	--	--	--	--	---------------------------	---	--	--	--	--	--	--	--	--	--

INFORMATION ON EMPLOYEES

REPORT THE TOTAL NUMBER OF EMPLOYEES AND NEW HIRES WHO ARE PROTECTED VETERANS, AS DEFINED IN THE INSTRUCTIONS. DATA ON NUMBER OF EMPLOYEES ARE TO BE ENTERED IN COLUMN A AND B, LINES 1.1 THROUGH 9. DATA FOR NEW HIRES ARE ENTERED IN COLUMNS C AND D. LINE 10 IS TOTAL OF EACH COLUMN. ENTRIES IN COLUMNS C AND D, LINES 1.1 THROUGH 9 (GRAY SHADED AREAS) ARE OPTIONAL. ENTER THE MAXIMUM AND MINIMUM NUMBER OF EMPLOYEES.

JOB CATEGORIES	NUMBER OF EMPLOYEES		NEW HIRES (PREVIOUS 12 MONTHS)	
	PROTECTED VETERANS (A)	TOTAL EMPLOYEES (B)	PROTECTED VETERANS (C)	TOTAL NEW HIRES (D)
EXECUTIVE/SENIOR LEVEL OFFICIALS AND MANAGERS 1.1				
FIRST/MID LEVEL OFFICIALS AND MANAGERS 1.2				
PROFESSIONALS 2				
TECHNICIANS 3				
SALES WORKERS 4				
ADMINISTRATIVE SUPPORT WORKERS 5				
CRAFT WORKERS 6				
OPERATIVES 7				
LABORERS/HELPERS 8				
SERVICE WORKERS 9				
TOTAL EMPLOYEES 10				

Report the total maximum and minimum number of permanent employees during the period covered by this report.

Maximum Number	Minimum Number

Form VETS-4212 11/2014

Federal Contractor Veterans' Employment Report (VETS-4212)

WHO MUST FILE: This VETS-4212 Report is to be completed by all nonexempt Federal contractors and subcontractors with a contract or subcontract in the amount of \$100,000 or more with any department or agency of the United States for the procurement of personal property or non-personal services. Services include but are not limited to the following services: utility, construction, transportation, research, insurance, and fund depository, irrespective of whether the government is the purchaser or seller. Entering into a covered Federal contract or subcontract during a given calendar year establishes the requirement to file a VETS-4212 Report during the following calendar year.

WHEN TO FILE: This annual report must be filed no later than September 30.

LEGAL BASIS FOR REPORTING REQUIREMENTS: Title 38, United States Code, Section 4212(d) mandates that Federal contractors and subcontractors subject to the statute's affirmative action provisions in 38 U.S.C. 4212(a) report, at least annually, the number of employees in their workforces by job category and hiring location, and the number of such employees, by job category and hiring location, who are qualified protected veterans. In addition, Federal contractors and subcontractors must report the total number of new hires during the period covered by the report and the number of such new hires who are qualified protected veterans. Further, Federal contractors and subcontractors must report on the maximum and minimum number of employees during the period covered by the report. The Department of Labor's Veterans' Employment and Training Service (VETS) has promulgated regulations found at 41 CFR part 61-300 to implement the reporting requirements of 38 U.S.C. 4212(d). The regulations require contractors and subcontractors to file the VETS-4212 Report to comply with the requirements of 38 U.S.C. 4212(d). The regulations in 41 CFR part 61-300 can be found at http://www.dol.gov/dol/cfr/Title_41/Chapter_61.htm.

HOW TO FILE THE VETS-4212 REPORT: The preferred method for filing VETS-4212 Reports is electronically through the VETS web-based filing system. Instructions for electronically filing the VETS-4212 Report are found on the VETS website at <http://www.dol.gov/vets/vets4212.htm>. Alternative filing methods are described below in these instructions.

Single Establishment Employers: Employers doing business at one hiring location may complete and submit a single VETS-4212 Report using the web-based filing system, or submit a single paper version of the VETS-4212 Report, as described below under Alternative Filing Methods.

Multi-Establishment Employers: Employers doing business at more than one hiring location, must file: (A) a VETS-4212 Report covering the principal or headquarters office; (B) a separate VETS-4212 Report for each hiring location employing 50 or more persons; and (C) EITHER, (i) a separate VETS-4212 Report for each hiring location employing fewer than 50 persons, OR (ii) consolidated reports that cover hiring locations within one State that have fewer than 50 employees. Multi-establishment employers doing business at more than 10 locations must submit their VETS-4212 Reports in the form of an electronic data file that complies with current Department of Labor specifications for the format of these records, and any other specifications established by the Department for the applicable reporting year. Multi-establishment employers with fewer than 10 hiring locations are strongly encouraged to submit their VETS-4212 Reports in the form of an electronic data file, but are not required to do so. In these cases, state consolidated reports count as one location each. VETS-4212 Reports in the form of electronic data files may be submitted through the web-based filing system. Electronic data files also may be transmitted electronically as an e-mail attachment (if they do not exceed the size stated in the specifications), or submitted on compact discs or other electronic storage media.

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ALTERNATIVE FILING METHODS: The VETS-4212 Report may also be filed in paper format. Reporting organizations may download a paper version of the VETS-4212 Report from the VETS website at <http://www.dol.gov/vets/vets4212.htm> or send a written request for the paper version of the VETS-4212 Report to: Office of the Assistant Secretary for Veterans' Employment and Training, U.S. Department of Labor, 200 Constitution Avenue, NW, Room S-1325, Washington, DC 20210, Attn: VETS-4212 Report Form Request.

WHERE TO FILE: VETS-4212 Reports in paper format or electronic data files on compact discs or other electronic storage media may be delivered by U.S. mail or courier delivery service to: Veterans' Employment and Training Service, c/o Department of Labor National Contact Center, 15000 Conference Center Drive, Suite B0132, Chantilly, VA 20194. Paper copies of the VETS-4212 Reports and electronic data files (if they do not exceed the size stated in the specifications) also may be sent as e-mail attachments to: VETS4212-customersupport@dol.gov

HOW TO PREPARE THE VETS-4212 REPORT: All fields and answers to questions in all areas of the VETS-4212 Report are mandatory unless otherwise specified below. If the multi-establishment employer has hiring locations employing fewer than 50 persons, the employer may file separate reports for each hiring location or consolidated reports that cover multiple hiring locations within one state.

Type of Reporting Organization: Indicate the type of contractual relationship (prime contractor or subcontractor) that the organization has with the Federal Government. If the organization serves as both a prime contractor and a subcontractor on various federal contracts, check both boxes. If a reporting organization submits only one VETS-4212 Report for a single location, check the Single Establishment box. If the reporting organization submits more than one VETS-4212 Report, one report should be checked as Multiple Establishment-Headquarters. The remaining VETS-4212 Reports should be checked as either Multiple Establishment-Hiring Location or Multiple Establishment-State Consolidated. For state consolidated reports, the number of hiring locations included in that report should be entered in the space provided. For each report, only one box should be checked within this block.

Company Identification Information: . Please note: If a Federal Contractor Report has been filed in the past, you need to utilize the company number assigned in previously submitted reports. If a company number is not available please leave the field blank. If there are any questions regarding a Company Number, please call the VETS-4212 Customer Support Center at (866) 237-0275 or e-mail VETS4212-customersupport@dol.gov.

Twelve Month Period Ending: Enter the end date for the twelve month reporting period used as the basis for filing the VETS-4212 Report. To determine this period, select a date in the current year between July 1 and August 31 that represents the end of a payroll period. The selected date will be the basis for reporting the Number of Employees, as described below. The twelve-month period preceding that date is your twelve-month covered period. This period is the basis for reporting New Hires, as described below. Any Federal contractor or subcontractor that has written approval from the Equal Employment Opportunity Commission to use December 31 as the ending date for the EEO-1 Report may also use that date as the ending date for the payroll period selected for the VETS-4212 Report.

Name and Address for Single Establishment Employers: Complete the identifying information under the Parent Company name and address section.

Name and Address for Multi-Establishment Employers: For parent company headquarters location, complete the name and address for the parent company headquarters and leave blank the name and address of the Hiring Location. For hiring locations of a parent company, complete the address for the Parent Company location, complete the name and address for the Hiring Location.

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NAICS Code, DUNS Number, and Employer ID Number: Single Establishment and Multi-Establishment Employers must complete the North American Industry Classification System (NAICS) Code, Dun and Bradstreet I.D. Number (DUNS), and Employer Identification Number (EIN) as described below:

- **NAICS Code:** Enter the six (6) digit NAICS Code applicable to the hiring location for which the report is filed. If there is not a separate NAICS Code for the hiring location, enter the NAICS Code for the Parent Company.
- **DUNS Number:** If there is a specific Dun and Bradstreet Identification applicable to the hiring location for which the report is filed, please enter the nine (9) digit in the space provided. If the hiring location does not have a DUNS Number, enter the DUNS number for the Parent Company. If an appropriate DUNS Number cannot be identified, leave this field blank.
- **Employer I.D. Number (EIN):** Enter the nine (9) digit number assigned by the I.R.S. to the contractor. If there is a specific EIN applicable to the hiring location for which the report is filed, enter that EIN. Otherwise, enter the EIN for the Parent Company.

Number of Employees: Report the total number of employees who are protected veterans for each of the 10 occupational categories (Lines 1.1 through 9) in column A. Report the total number of employees, including protected veterans, for each of the 10 occupational categories (Lines 1.1 through 9) in column B. Blank spaces will be considered zeros.

New Hires (Previous 12 Months): Report the total number of employees who were hired and included in the payroll for the first time during the 12-month period preceding the ending date of the selected payroll period. Report the total number of new hires who are protected veterans in column C. Report the total number of new hires, including protected veterans, in column D. Providing new hire data for each of the occupational categories (columns C and D, lines 1.1 through 9) is optional. Blank spaces will be considered zeros.

Maximum/Minimum Employees: Report the maximum and minimum number of employees on board during the twelve-month period covered by this report, as indicated by 41 CFR 61-300.10(a)(3).

DEFINITIONS:

'Employee' – means any individual on the payroll of an employer who is an employee for purposes of the employer's withholding of Social Security taxes except insurance sales agents who are considered to be employees for such purposes solely because of the provisions of 26 U.S.C. 3121 (d)(3)(B) (the Internal Revenue Code). Part-time employees and leased employees are included in the definition of 'employee.' The definition does not include persons hired on a casual basis for a specific job (e.g., persons at a construction site whose employment relationship is expected to terminate with the end of the employee's work at the site); persons employed temporarily in an industry other than construction who are hired through a hiring hall or some other referral arrangement; or persons on the payroll of an employment agency who are referred by such agency for work to be performed on the premises of another employer under that employer's direction and control, as provided in 41 CFR 61-300.2(b)(5).

'Hiring location' – means an establishment as defined at 41 CFR 61-300.2(b)(6).

'Job Categories' – means any of the following: Officials and Managers (Executive/Senior Level Officials and Managers and First/Mid-Level Officials and Managers), Professionals, Technicians, Sales Workers, Administrative Support Workers, Craft Workers, Operatives, Laborers and Helpers, and Service Workers and are defined in 41 CFR 61-300.2(b)(7).

'Protected Veteran' – means a veteran who is protected under the nondiscrimination and affirmative action provisions of the Vietnam Veterans' Readjustment Assistance Act, 38 U.S.C. 4212; specifically a veteran who may be classified as an active duty wartime or campaign badge veteran, disabled veteran, Armed Forces service medal veteran, or recently separated veteran,

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- **'Active duty wartime or campaign badge Veteran'** – means a veteran who served on active duty in the U.S. military, ground, naval or air service during a war or in a campaign or expedition for which a campaign badge has been authorized under the laws administered by the Department of Defense.
- **'Armed Forces Service Medal Veteran'** – means any veteran who, while serving on active duty in the U.S. military, ground, naval or air service, participated in a United States military operation for which an Armed Forces service medal was awarded pursuant to Executive Order 12985 (61 FR 1209, 3 CFR, 1996 Comp., p. 159).
- **'Disabled Veteran'** – means (1) A veteran of the U.S. military, ground, naval or air service who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Secretary of Veterans Affairs, or (2) A person who was discharged or released from active duty because of a service-connected disability.
- **'Recently Separated Veteran'** – means a veteran during the three-year period beginning on the date of such veteran's discharge or release from active duty in the U.S. military, ground, naval or air service.

RECORD KEEPING: Employers must keep a copy of the completed annual VETS-4212 Report(s) submitted to DOL for a period of three years.

Public Burden Statement: Public reporting burden for this collection is estimated to average 20 minutes per location to make an electronic filing and 40 minutes per location to make a paper filing, including the time for reviewing instructions, searching existing data source, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to the Department of Labor, Veterans' Employment and Training Service, Office of Information Management, Room N-1316, 200 Constitution Avenue, NW, Washington D.C. 20210 or electronically transmitted to VETS4212-customersupport@dol.gov All completed VETS-4212 Reports should be sent to the address indicated on the front of the form. See actual VETS-4212 Report for additional disclosures.

FEDERAL EEO BID CONDITIONS – 00 5500

PART 1 - GENERAL

1.1 GENERAL

A. Definitions. As used in these Specifications:

1. “Covered area” means the geographical area described in the solicitation from which this contract resulted;
2. “Director” means Director, Office of Federal contract Compliance Programs (OFCCP), United States Department of Labor (DOL), or any persons to whom the Director delegates authority;
3. “Employer” identification number” means the Federal Social Security number used on the Employer’s Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
4. “Minority” includes:
 - a. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - b. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central of South American or other Spanish culture or origin, regardless of race);
 - c. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - d. American Indian or Alaska Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

B. Whenever the Contractor, or any Subcontractor at any tier, subcontract a portion of the Work, involving any construction trade, it shall physically include in each Subcontract in excess of \$10,000 the provisions of these Specification and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

C. The Contractor shall implement the specific affirmative action standards provided in paragraphs F1 through F16 of these Specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goal in each craft during the period specified.

Covered construction contractors performing construction Work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographical area where the Work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any OFCCP office or from federal procurement contracting officers.

D. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor’s obligations under this Specification, Executive Order 11246, or the regulations promulgated pursuant thereto.

FEDERAL EEO BID CONDITIONS – 00 5500

- E. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period of an approved training program and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities.
- F. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this Specification shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative actions steps at least as extensive as the following:
1. Ensure and maintain a working environment free of harassment, intimidation; and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to Work. The Contractor, where possible, shall assign two or more women to each construction project. The Contractor shall specifically ensure that all superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligations to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 2. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organization's responses.
 3. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor, by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
 4. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 5. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the DOL. The Contractor shall provide notice of these programs to the sources complied under F2 above.
 6. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction Work is performed.

FEDERAL EEO BID CONDITIONS – 00 5500

7. Review, at least annually, the company's EEO policy and affirmative action obligations under these Specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendent, etc., prior to the initiation of construction Work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and dispositions of the subject matter.
 8. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.
 9. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
 10. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.
 11. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR 60-3.
 12. Conduct at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 13. Ensure that seniority practices, job classifications, Work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel, and employment related activities to ensure that the EEO policy and the Contractor's obligations under these Specifications are being carried out.
 14. Ensure that all facilities and company activities are nonsegregated except that separate or single-used toilet, necessary changing facilities and necessary sleeping facilities shall be provided to assure privacy between the sexes.
 15. Document and maintain a record of all solicitations of offers for Subcontractors from minority and female construction contractors and suppliers, including circulations of solicitations to minority and female contractor associations and other business associations.
 16. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- G. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations F1 through F16. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any or more of its obligations under F1 through F16 of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of

FEDERAL EEO BID CONDITIONS – 00 5500

the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

- H. A single goal for minorities and a separate goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally the Contractor may be in violation of the Executive Order if a specific minority group of women is under utilized.)
- I. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
- J. The Contractor shall not enter into any Subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
- K. The Contractor shall carry out such sanctions or penalties for violation of these Specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing Subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these Specifications and Executive Order 11236, as amended.
- L. The Contractor, in fulfilling its obligations under these Specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph F of these Specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunities. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations or these Specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- M. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic apprentice, trainees, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that the existing records satisfy this requirement, contractors shall not be required to maintain separate records.
- N. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish difference standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Programs).

FEDERAL EEO BID CONDITIONS – 00 5500

- O. The bidder’s attention is called to the “Equal Employment Clause” and the “Standard Federal Equal Employment Opportunity Construction Contract Specifications” set forth herein.
- P. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor’s aggregate work force in each trade on all construction work in the covered area, are as set forth in item S.

These goals as listed in Item S are applicable to all the Contractor’s construction Work (whether or not it is federal or federally-assisted) performed in the covered area.

The Contractor’s compliance with the Executive Order and the regulations in 41 CFR 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. If the Contractor performs construction Work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the Work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally and non-federally involved construction.

The hours on minority and female employment and training must be substantially uniform throughout the length of the contract and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the Contractor’s goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total WORK hours performed.

- Q. The Contractor shall provide written notification to the Owner, for all subcontract documents as follows: the name, address and telephone number of Subcontractors and their employer identification number; the estimated dollar amount of the subcontracts; estimated starting and completion dates of the subcontracts; and the geographical area in which the contract is to be performed.

This written notification shall be required for all construction subcontracts in excess of \$10,000 at any tier for construction Work under the contract resulting from this Project’s solicitation.

- R. As used in the Bid Notice, and in the contract resulting from this project’s solicitation, the “covered area” is the State of Alaska.

S. Goal and Timetable

- 1. The following goal and timetable for female utilization shall be included in all federal and federally-assisted construction contracts and subcontracts in excess of \$1,000. The goal is applicable to the Contractor’s aggregate on-site construction work force whether or not part of that work force is performing Work on a federal or federally-assisted construction contractor or subcontract.

ALASKA GOAL AND TIMETABLE FOR WOMEN*

<u>Timetable</u>	<u>Goal</u> **
Until Further Notice	6.9%

FEDERAL EEO BID CONDITIONS – 00 5500

- 2. The following goals and timetable for minority utilization shall be included in all federal or federally-assisted construction contracts and subcontracts in excess of \$10,000 to be performed in Alaska. The goals are applicable to the Contractor’s aggregate on-site construction work force whether or not part of that work force is performing Work on a federal or federally-assisted construction contract or subcontract.

ALASKA GOAL AND TIMETABLE FOR MINORITY UTILIZATION

<u>Timetable</u>	<u>Economic Area (ES)***</u>	<u>Goal **</u>
Until Further Notice	Anchorage SMSA Area	8.7%
	Remainder of State	15.1%

* The goal and timetable for women listed above applies to Alaska as well as nationwide.

** The Director, from time to time, shall issue goals and timetables for minority and female utilization which shall be based on appropriate work force, demographic or other relevant data and which shall cover construction projects, or construction contracts performed in specific geographical areas. The goals shall be applicable to each construction trade in a covered contractor’s or subcontractor’s entire work force which is working in the area covered by the goals and timetables, shall be published as notices in the Federal Register, and shall be inserted by the contracting officers and applicants, as applicable, in the Notice required by 41 CFR 60-4.2. Covered construction contractors performing construction Work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographical area where the WORK is being performed.

*** Refer to the Standard Metropolitan Statistical Areas (SMSA) and Economic Areas (EA), office of Management and Budget, 1975.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- A. Complete the following forms (included as part of this section). Items 1-4 will be due with the Agreement and other information required in the Notice of Intent to Award.
 - 1. EEO-1 Certification Federal Aid contracts
 - 2. EEO Estimated Employment Profile
 - 3. EEO Notice to Labor Unions, Minority/Women Organization
 - 4. EEO Signature Page
 - 5. EEO Weekly Payroll Report

FEDERAL EEO BID CONDITIONS – 00 5500

CITY AND BOROUGH OF JUNEAU

EEO-1 CERTIFICATION

US DOT Federal-Aid Contracts

JNU Runway Safety Area Improvements

BE17-045

This certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor [41 CFR 60-1.7 (b) (1)] and must be completed by the successful Bidder and each proposed Subcontractor participating in this contract.

PLEASE CHECK APPROPRIATE BOXES

The Bidder Proposed Subcontractor hereby CERTIFIES:

PART A. Bidders and proposed Subcontractors with 50 or more year-round employees and a federal contract amounting to \$50,000 or more are required to submit one federal Standard Report Form 100 during each year that the two conditions exist (50 employees and a \$50,000 federal contract).

The company named below (Part C) is exempt from the requirements of submitting the Standard Report Form 100 this year.

NO (go to PART B) YES (go to PART C)

Instructions and blank Standard Report Form 100's may be obtained from a local U.S. Department of Labor office, or by writing to:

US Department of Labor
The Joint Reporting Committee
P.O. Box 19100
Washington, D.C. 20036-9100

Telephone number: (757) 461-1213

PART B. The company named below has submitted the Standard Report Form 100 this year.

NO YES

Note: Bidders and proposed Subcontractors who have not filed the required Standard Report Form 100 and are not exempt from filing requirements will not be awarded this contract or subcontract until Form 100 has been filed for the current year ending June 30.

PART C.

Signature of Authorized Company Representative

Title

Company Name

Company Address (Street or PO Box, City, State, Zip)

Date

()

Phone Number

FEDERAL EEO BID CONDITIONS – 00 5500

EQUAL EMPLOYMENT OPPORTUNITY (EEO)

Estimated Employment Profile

Firm: _____ Prepared By: _____

In response to the Notice of Intent to Award letter, **the prime Contractor and each Subcontractor must submit a complete profile**

Total Number of Employees to Work on Project: Male _____ Female _____
Projected Tradeworker Hours¹: Male _____ Female _____
Total Number of Minorities to Work on Project: Male _____ Female _____
Projected Minority Tradeworkers Hours²: Male _____ Female _____
Projected Tradeworker Goal Attainment³: Minority _____% Female _____%

List the number and gender of ALL tradeworkers anticipated on this Project:

Table with columns: Trade⁴, Asian-Indian, Asian-Pacific, Black, Hispanic, Native, White. Includes rows for Crew Supervisor⁵ and Apprentices or Trainees.

¹Total for all tradeworkers (including minorities and females).

²Minority female tradeworker hours may count toward only one goal, either female or minority, but not both. If a minority female's hours are counted as minority, rather than female, add her hours to those of the male minorities' before calculating projected goal attainment.

³To calculate project goal attainment: Add total male to total female hours to determine the total hours for the job. Divide the minority hours by the total hours for the job; the percentage result is the projected minority goal. Divide female hours by the total hours for the job, the percentage result is the projected female goal.

⁴List Journey Trades, such as Carpenter, Electrician, Ironworker, Laborer, Painter, Plumber, Power Equipment Operator, etc.

⁵Example:

Example table showing counts for CREW SUPERVISOR, PILEDRIVER, and APPRENTICE (OPERATING ENGINEER) across various categories.

FEDERAL EEO BID CONDITIONS – 00 5500

EQUAL EMPLOYMENT OPPORTUNITY (EEO)

Notice to Labor Unions, Minority/Women Organizations

To be completed by each Contractor and Subcontractor, regardless of the value of their contract. If no union, job service program, or labor organization is involved write and attach a letter stating how employees were recruited.

To: _____
(Name of labor union or other employment organization)

We currently hold a prime contract, or subcontract with the City and Borough of Juneau which involves federal funds. Under the provisions of the contract and all subcontracts, in accordance with Section 202 of Executive Order No. 11246 as amended, we are obliged not to discriminate against any employee or applicant for employment because of race, color, creed, national origin, age, or sex. This obligation not to discriminate in employment includes, but is not limited to: employment, upgrading, transfer, demotion, recruitment, and advertising; rates of pay or other forms of compensation; selection for training including apprenticeship; and layoff or termination.

We will post this notice in conspicuous places available to employees or applicants for employment.

(Firm)

EEO Representative at Job Site Date EEO Representative at Office Date

↓ To be completed by labor union or other organization ↓

The _____ agrees to comply with all applicable
(Name of labor union or other labor organization)

federal, state, and local laws* regarding non-discrimination** in employment.*** We also agree to provide the Employer with all information necessary to enable it to comply with these laws,* including the preparation and filing of any necessary reports.

*Laws include regulations, rules, directives and orders, including those by the Equal Opportunity Commission, the Office of Federal contract Compliance, the United States Department of Labor, and the federal funding agency when applicable to WORK performed on this contract.

** Non-discrimination includes freedom from discrimination because of race, color, national origin, creed, religion, age or sex.

*** Employment includes acceptance, selection, classification and referral of applicants for membership and/or employment.

Name and Title of Labor Representative Signature Date

FEDERAL EEO BID CONDITIONS – 00 5500

EQUAL EMPLOYMENT OPPORTUNITY (EEO)

Signature Page

In response to the Notice of Intent to Award letter, the Prime Contractor and each Subcontractor **must** complete and return this Signature Page and be current with all EEO* filing requirements.

* contracts and Subcontracts which do not exceed \$10,000 are exempt from the requirements of the equal opportunity clause, provided, that where a contractor has contracts or subcontracts containing federal assistance in any 12-month period, which have an aggregate total value (or can reasonably be expected to have an aggregate total value) exceeding \$10,000, this \$10,000 or under exemption does not apply (regardless of whether any single contract exceeds \$10,000.)

I certify that I have met all applicable EEO requirements and all attached documents are complete and correct. I understand that any false statements made to meet any requirement will result in contract termination and/or action under Federal or State law. I swear that neither the firm, nor its owners or principals, is debarred or suspended from contracting with any government agency.

Firm _____ Capacity: Prime Sub

Type of WORK _____ Employer ID No. _____

Estimated Start Date _____ Estimated Finish Date _____

contract or Subcontract Amount \$ _____ Agreement Date _____

Authorized Signature _____ Date _____

Printed Name _____ Title _____

Firm's DBE Officer _____

Firm's EEO Officer _____

Street Address _____

City _____ State _____ Zip _____

PHONE _____ FAX _____

FEDERAL EEO BID CONDITIONS – 00 5500

EQUAL EMPLOYMENT OPPORTUNITY (EEO)

Weekly Payroll Report

Each Contractor and each Subcontractor must complete, sign, and submit this form **each week** during the length of the contract. Subcontractors should report only for their subcontract. EEO goal compliance is measured against tradeworker hours.

Firm _____ Capacity: Prime Sub

Type of WORK _____

Percent Complete _____ Week Ending _____

Street Address _____

City _____ State _____ Zip _____

Prepared by _____ Date _____

List: Each **minority** and **female** tradeworker employee, who worked this period.

<u>Construction Trade</u> ¹	<u>Work Classification</u> ²	<u>Ethnicity</u> ³	<u>Sex</u>	<u>Employee's Name</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Tradeworker Totals: Entire Crew: Hrs. # _____ Hrs. _____
 Minority: Hrs. # _____ Hrs. _____
 Female: Hrs. # _____ Hrs. _____

¹i.e., Concrete, Demolition, Electrical, Iron, and Operating Engineer
²i.e., Crew Supervisor, Journey Level, Apprentice, Helper, Etc.
³iAI-Asian Indian, AP-Asian Pacific, B-Black, C-Caucasian, H-Hispanic, N-Native, or O-Other

**FEDERAL LABOR STANDARDS, REPORTING, AND
PREVAILING WAGE RATE DETERMINATION - 00 5600
Reporting During Contract**

- A. **Within 15 Days after Notice of Intent to Award**, the Contractor must compile and submit a list of all Subcontractors and material suppliers, showing all tiers. For each company listed include name, address, phone, employer tax number; DBE status if any; estimated subcontract amount; estimated start and finish dates; and copies of bid tabulations with firm name and number. Send the list to *Addresses B and C*.
- B. **Within 30 Days of Notice to Proceed**, the Contractor and each Subcontractor, who are required to file EEO-1 reports (Standard Form 100 [SF-100]), must send it to the Office of Federal Contract Compliance Programs (OFCCP) Area Office - Address C.
- C. Before each Friday, the Contractor and each Subcontract must file:
1. Weekly Employment Opportunity (EEO) Reports (page 004440-11) for the previous week to *Address A*. If the information requested (race and gender) is indicated on the copy of the payroll, then this Weekly EEO Report is hereby waived.
- D. **Certified Payrolls must be submitted every two weeks.** Before the second Friday, the Contractor and each Subcontractor must file:
1. Certified Payrolls with Statements of Compliance for the previous two weeks. If there was no activity for that pay period, indicate "No Activity." Indicate "Start" on your first payroll, and "Final" on your last payroll for this project. Send the original to *Address B* and a complete copy to *Address A*, or another CBJ representative, as *designated*

Correspondence regarding State of Alaska Department of Labor and Workforce Development (ADOL) Title 36 requirements may be submitted electronically or paper copies can be submitted by mail. To submit Title 36 documents electronically, go to <https://myalaska.state.ak.us/home/app>. If filing electronically, submit certified payrolls to ADOL at the website above and email a copy of all certified payrolls to Jennifer Mannix, or her designee, at the email address below. If Contractor elects to submit paper copies, they should be submitted to the physical addresses below.

- E. By the 5th of each month, each Contractor and Subcontractor must complete the Monthly Employment Utilization Report (CC257) for the previous month for its aggregate workforce in Alaska (for federal and non-federal projects). Make a list of all projects (federal and non-federal) in Alaska over \$10,000. Include the firm name, name and location of project, project #, % complete, contract amount, and established date of completion. Send both the CC257 and the list of projects to Addresses A and C.
- F. Preparing the final payment request, the Contractor must verify that the subcontractor list is up-to-date and includes all parties submitting certified payrolls (i.e., equipment rental with operator companies, trucking services providing imported materials, surveying firms, etc.). Send a copy of amended lists to Addresses A and B. Submit completed Compliance Certification and Release, Section 006200 of the CBJ Standard Specifications for Civil Engineering Project and Subdivision Improvements, December 2003 Edition, with current Errata, for the Contractor to Address A.

<u>Address A</u>	<u>Address B</u>	<u>Address C</u>
Contract Administrator	Wage and Hour Section	OFCCP
Engineering Department	AK Dept of Labor and Workforce Dev/	Area Office
City and Borough of Juneau	Labor Standards and Safety Division	605 W. 4th Ave., Room G68
155 S. Seward Street	Wage and Hour Administration	Anchorage, AK 99501
Juneau, AK 99801	P O Box 21149	(907) 271-2864
(907) 586-0873	Juneau, AK 99802-1149	
greg.smith@juneau.org	(907) 465-4842	
	http://labor.state.ak.us/lss/home.htm	

EMPLOYMENT SECURITY TAX CLEARANCE FORM – 00 6100

Employment Security Tax Clearance

Date: _____

To: Alaska Department of Labor
Juneau Field Tax Office
PH 907-465-2787
FAX 907-465-2374

From: _____

**Subject: JNU Runway Safety Area Improvements, Phase 2B
Contract No. BE17-045**

Timeframe of Contract _____

Please advise whether or not clearance is granted for the following Contractor or Subcontractor:
(List only one Contractor or Subcontractor per page.)

Name	Address

Per AS 23.20.265 of the Alaska Employment Security Act, this request is for tax liability clearance and release to make final payment for Work performed under the subject contract. Please send your response to:

Greg Smith, Contract Administrator
Engineering Department
155 S. Seward Street
Juneau, Alaska 99801
FAX 907-586-4530

- Tax Clearance is granted.
- Tax Clearance is NOT granted.

Remarks: _____

Signature

Date

Title

END OF SECTION

COMPLIANCE CERTIFICATE AND RELEASE – 00 6200

PROJECT: JNU RUNWAY SAFETY AREA IMPROVEMENTS, PHASE 2B
CONTRACT NO: BE17-045

The Contractor must complete and submit this to the Engineering Contract Administrator with respect to the entire contract.

Completed forms may be submitted upon completion of the Project. All requirements and submittals must be met before final payment will be made to the Contractor.

I certify that the following and any referenced attachments are true:

- All Work has been performed, materials supplied, and requirements met in accordance with the applicable Drawings, Specifications, and Contract Documents.
- All Suppliers and Subcontractors have been paid in full with no claims for labor, materials or other services outstanding. If all Subcontractors and suppliers are not paid in full, please explain on a separate sheet.
- All employees have been paid not less than the current prevailing wage rates set by the State of Alaska (or U.S. Department of Labor, as applicable).
- All equal employment opportunity, certified payroll and other reports have been filed in accordance with the prime contract.
- The attached list of Subcontractors is complete (required from Contractor). The Contract Administrator was advised and approved of all Subcontractors before Work was performed and has approved any substitutions of Subcontractors.
- All DBE firms listed as a precondition of the prime contract award must have performed a commercially useful function in order for the Work to count to a DBE goal. All DBE firms performed the Work stated and have received at least the amount claimed for credit in the Contract Documents.
- All DBE Subcontractors must attach a signed statement of the payment amount received, the nature of Work performed, whether any balance is outstanding, and indicate that no rebates are involved.
- If the amount paid is less than the amount originally claimed for DBE credit, the Contractor has attached approval from the Contract Administrator for underutilization.

I understand it is unlawful to misrepresent information in order to receive a payment which would otherwise be withheld if these conditions were not met. I am an authorized agent of this firm and sign this freely and voluntarily. The foregoing statements are true and apply to the following project contractor.

Firm Name Capacity: CONTRACTOR

Signed Printed Name and Title Date

Return completed form to: Engineering Contract Administrator, City and Borough of Juneau, 155 South Seward Street, Juneau, AK 99801. Call (907) 586-0873 if we can be of further assistance or if you have any questions.

END OF SECTION

GENERAL CONDITIONS OF THE CONTRACT – 00 7000

For the following Project: **JNU Runway Safety Area Improvements, Phase 2B
Juneau International Airport
1873 Shell Simmons Drive, Suite 200
Juneau, Alaska 99801**

The Owner: **Juneau International Airport
City and Borough of Juneau**

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GENERAL CONDITIONS OF THE CONTRACT – 00 7000

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General and Supplementary), drawings, specifications, addenda issued prior to execution of the Contract, other documents listed in the Agreement and modifications issued after execution of the Contract. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of addenda relating to bidding requirements).

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect/Engineer and Contractor, (2) between the Owner and a subcontractor (of any tier), (3) between the Owner and Architect/Engineer or (4) between any persons or entities other than the Owner and Contractor.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the project.

§ 1.1.4 THE PROJECT

The project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

§ 1.1.5 THE DRAWINGS

The drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and work quality for the Work, and performance of related services.

§ 1.1.7 THE PROJECT MANUAL

The project manual is a volume assembled for the Work that may include the bidding requirements, sample forms, Conditions of the Contract and specifications.

§ 1.1.8 OTHER DEFINITIONS

Advisory Circulars (ACs) - Informational documents produced by the Federal Aviation Administration to guide institutions, operations, and individuals within the aviation industry, as well as the general public. Advisory Circulars are intended to be informative in nature; however, they may describe actions or advice that the FAA expects to be implemented or followed.

Agreement—The written form, executed by the Contractor and Owner, legally binding the parties and covering the Work to be performed; other documents are attached to the form and made a part thereof as provided therein.

Airport Improvement Program (AIP) - A grant-in-aid program administered by the FAA.

Air operations area (AOA) - For the purpose of these specifications, the term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

GENERAL CONDITIONS OF THE CONTRACT – 00 7000

Airport - An area of land or water that is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; and airport buildings and facilities located in any of these areas.

Architect - See Article 4.

Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid - The bidder's offer or proposal submitted on the prescribed form setting forth the price or prices for the Work.

Change Order - See Article 7.

Construction Safety and Phasing Plan (CSPP) - The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

Contract and Contract Documents - Written documents covering the Work to be performed. The awarded contract shall include, but is not limited to the documents identified in the Agreement between Owner and Contractor.

Contractor - See Article 3.

Defective Work - Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or Work that has been damaged prior to the Owner's Representative's recommendation of final payment.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the parties to sign and deliver.

Engineer - See Article 4.

FAA - The Federal Aviation Administration of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or its duly authorized representative.

Federal Specifications - The Federal Specifications and Standards, Commercial Item Descriptions, and supplements, amendments, and indices thereto are prepared and issued by the General Services Administration of the Federal Government.

Inspector - A representative of the Owner or Architect/Engineer assigned to make necessary inspections, observations, and/or tests of the Work performed or being performed, or of the materials furnished or being furnished by the Contractor, but without authorization to make changes or interpretations of the Work.

Milestone - A key or critical point in time for reference or measurement.

Modification - (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (2) a Construction Change Directive or (3) a written order for a minor change in the Work issued by the Owner.

Notice of Intent to Award - The written notice by the Owner to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the requirements listed therein, within the time specified, the Owner will enter into an Agreement.

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Notice of Award - The written notice by the Owner to the apparent successful bidder stating that the apparent successful bidder has complied with all conditions for award of the Contract, and establishing the date of commencement of the Contract time.

Notice of Substantial Completion - A form signed by the Owner and the Contractor identifying that the Work is substantially complete and fixing the date of Substantial Completion.

Notice To Proceed - The written notice issued by the Owner to the Contractor authorizing the Contractor to proceed with the Work.

Orders – Guidance documents published by the FAA that outline procedures and regulatory requirements.

Owner and Owner's Representative – See Article 2.

Runway - The area on the airport prepared for the landing and takeoff of aircraft.

Sponsor - A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.

Sub-Consultant - The individual, partnership, corporation, joint-venture or other legal entity having a direct contract with the Architect/Engineer, or with any of its consultants to furnish services with respect to the project.

Subcontractor - See Article 5.

Supplier - A material manufacturer, fabricator, supplier, distributor, or vendor.

Taxiway - For the purpose of this document, the term taxiway means the portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

Underground Utilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.

Using Agency - The entity that will occupy or use the completed project.

Working day - A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When Work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the specifications into divisions, sections and articles, and arrangement of drawings shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

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§ 1.2.4 If any portion of the Contract Documents is in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence:

- Permits from other agencies as may be required by law, excepting the definition of “permittee” in these permits.
- Modifications
- The Owner-Contractor Agreement;
- Addenda;
- Section 008000 – Supplementary General Conditions;
- Section 007000 – General Conditions of the Contract for Construction;
- Specifications – Embodying all other sections of the project manual;
- Drawings: as between schedules and information given on drawings, the schedules shall govern; as between written dimensions given on drawings and scaled measurements, the written dimensions shall govern; as between large-scale drawings and small-scale drawings, the larger scale shall govern;
- Performance Bond, Labor and Material Payment Bond.

All such conflicts shall be reported, in writing to the Owner’s Representative. Schedules, lists, indexes, tables, inventories, written instruction, written descriptions, summaries, statements, classifications, specifications, written selections or written designations, although appearing on the drawings, are deemed to be and are specifications as defined by this section. The principles as set forth herein shall not alter the provisions of Section 1.2.1.

In the event there is a conflict between or among any provisions within one of the component parts of the Contract Documents, the higher standard or more stringent requirement shall govern.

§ 1.2.5 Any material or operation specified by reference to published specifications of a manufacturer, published Advisory Circulars, a society, an association, a code or other published standard shall comply with requirements of the listed document and project specifications; as between referenced documents, the more stringent code or performance requirements shall govern. The Contractor, if requested, shall furnish an affidavit from the manufacturer certifying that the materials or products delivered to the Project meet the requirement specified.

§ 1.3 CAPITALIZATION

§ 1.3.1 Terms written with title capitalization in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents.

§ 1.4 INTERPRETATION

§ 1.4.1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 EXECUTION OF CONTRACT DOCUMENTS

§ 1.5.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND CONTRACT DOCUMENTS

§ 1.6.1 Neither the Contractor, nor any subcontractor or supplier, nor any other person or organization performing any of the Work under a contract with the Owner shall have or acquire any title to or ownership rights in any of the drawings, technical specifications, or other documents used on the Work, and they shall not reuse any of them on the extensions of the project or any other project without written consent of the Owner.

§ 1.7 FEDERAL CONTRACT PROVISIONS

§ 1.7.1 The Contractor shall comply with and shall incorporate into all subcontracts all applicable federal contract provisions identified in the Supplementary General Conditions throughout the bidding, award, and performance of this Contract.

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ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the City and Borough of Juneau, acting through its legally constituted officials, officers, or employees and is referred to throughout the Contract Documents as if singular in number. For purposes of this project, the Owner shall be the Juneau International Airport who, through its Manager, shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. This person shall be titled the Owner's Representative and referred to in the Contract Documents as Owner or Owner's Representative.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Except for permits and fees, including those required under Section 3.7 that are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.2 Owner shall apply for, and obtain, a building permit for this project and shall pay for any inspection or review fees imposed by jurisdictional authorities under the building permit. In addition, the Owner shall utilize and pay for the services of an inspector for Work requiring "special inspections" as designated by the building permit.

§ 2.2.3 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request for such information or services.

§ 2.2.4 Unless otherwise provided in the Contract Documents, the Owner shall furnish the Contractor, free of charge, six 11"x17" sets of conformed drawings, and six copies of the conformed project manual.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

§ 2.3.1 If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a three-day period. If the Contractor within such three-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5 OWNER'S RIGHT TO INSPECT RECORDS

§ 2.5.1 The Owner, or any of its duly authorized representatives, shall have the right to examine all project records and documents, including without limitation, all books, correspondence, reports, analyses, instructions, drawings, receipts, vouchers, memoranda, and all financial and accounting books, records, and data, including those related to cost or pricing for this Contract, all related Change Orders and Contract modifications, and all other documents of the Contractor and any tier Subcontractors that are directly pertinent to this specific Contract for the purpose of making an audit, examination, reproduction, excerpts, or transcriptions. All required records, as further described in

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Section 13.8, shall be retained by the Contractor and its Subcontractors after the Owner makes final payments and all other pending matters are closed.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative as identified in writing by the Contractor.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect/Engineer or the Owner's Representative in the administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Before starting each portion of the Work, the Contractor shall carefully study and compare the various drawings and other Contract Documents relative to that portion of the Work, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to Owner as a request for information in such form as the Owner.

§ 3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Owner, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Owner. This does not release the Contractor from the obligation to perform Work in conformance with all provisions of federal, state, and local laws and regulations.

§ 3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Owner in response to the Contractor's notices or requests for information pursuant to Sections 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Sections 4.3. If the Contractor fails to perform the obligations of Sections 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect/Engineer for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Owner.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using its best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and shall not proceed with that portion of the Work without further written instructions from the Owner. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage.

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§ 3.3.2 The Contractor shall control its operations and the operations of its subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

- .1 When the Work requires the Contractor to conduct its operations within an AOA of the airport, the Work shall be coordinated with designated airport operations personnel (through the Owner) at least 48 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the Owner and until the necessary temporary marking and associated lighting is in place.
- .2 When the Work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until the satisfactory conditions are provided.

§ 3.3.3 The Contractor shall conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction

- .1 All of the Contractor's operations shall be conducted in accordance with the project Construction Safety and Phasing Plan (CSPP) and the provisions set forth within the current version of AC 150/5370-2. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a Safety Plan Compliance Document that details how it proposes to comply with the requirements presented within the CSPP.
- .2 The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures.
- .3 The Contractor is responsible for the conduct of all subcontractors it employs on the project. The Contractor shall assure that all subcontractors are made aware of the requirements of the CSPP and that they implement and maintain all necessary measures.
- .4 No deviation or modifications may be made to the approved CSPP unless approved in writing by the Owner.

§ 3.3.4 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, all tiers of Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

§ 3.3.5 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.6 The Contractor shall maintain the Work during construction and until the Work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the Work is maintained in satisfactory condition at all times. In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations. All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items or within the lump sum, and the Contractor will not be paid an additional amount for such work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Owner and in accordance with a Change Order.

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§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. Any person employed by the Contractor or by any subcontractor who, in the opinion of the Owner, does not perform the Work in a proper and skillful manner, or is intemperate or disorderly shall, at the written request of the Owner be removed forthwith by the Contractor or Subcontractor employing such person, and shall not be employed again in any portion of the Work without the approval of the Owner. Should the Contractor fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Owner may suspend the Work by written notice until such orders are complied with.

§ 3.5 WARRANTY

§ 3.5.1 The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES AND NOTICES

§ 3.7.1 Except as provided under Article 2.2, and unless otherwise provided in the Contract Documents, the Contractor shall cooperate with the Owner who will apply for, obtain, and pay for necessary building permits. The Contractor shall schedule and coordinate all necessary inspections and obtain all required certificates required by the building permit, even when such building permit is obtained by the Owner.

§ 3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work. Prior to commencement of construction activities the Contractor shall post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

§ 3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Owner in writing, and necessary changes shall be accomplished by appropriate modification.

§ 3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.5 Certified Payrolls. Any Contractor or Subcontractor who performs Work on a public construction Contract for the Owner shall file a certified payroll with the Alaska Department of Labor before the second Friday of every two weeks that covers the preceding two weeks. (Section 14-2-4 ACLA 1949; am Section 4 ch 142 SLA 1972).

- .1 In lieu of submitting the State payroll form, the Contractor's standard payroll form may be submitted, provided it contains the information required by AS 36.05.040 and a statement that the Contractor is complying with AS 36.10.010.

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- .2 A Contractor or Subcontractor who performs Work on public construction in the State, as defined by AS 36.95.010(3), shall pay not less than the current prevailing rate of wages as issued by the Alaska Department of Labor before the end of the pay period. (AS 36.05.010).

§ 3.7.6 Prevailing Wage Rates. Wage rates for Laborers and Mechanics on Public Contracts, AS 36.05.070. The Contractor, or Subcontractors, shall pay all employees unconditionally and not less than once a week. Wages may not be less than those stated in Section 3.7.5.2, regardless of the contractual relationship between the Contractor or Subcontractors and laborers, mechanics, or field surveyors. The scale of wages to be paid shall be posted by the Contractor in a prominent, easily accessible place at the site of the Work.

- .1 Failure to Pay Agreed Wages, AS 36.05.080. If it is found that a laborer, mechanic, or field surveyor employed by the Contractor or Subcontractor has been, or is being, paid a rate or wages less than the established rate, the Owner may, by written notice, terminate the Contractor's or Subcontractor's right to proceed with the Work. The Owner may prosecute the Work to completion by contract or otherwise, and the Contractor and sureties will be held liable to the Owner for excess costs for completing the Work. (Section 2 ch 52 SLA 1959).
- .2 Listing Contractors Who Violate Contracts, AS 36.05.090. In addition, a list giving the names of persons who have disregarded the rights of their employees shall be distributed to all departments of State government and all political subdivisions. No person appearing on this list, and no firm, corporation, partnership or association in which the person has an interest, may work as a Contractor or Subcontractor on a public construction Contract for the State, or a political subdivision of the State, until three years after the date of publication of the list. (Section 3 ch 52 SLA 1959; am Section 9 ch 142 SLA).

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the contract sum all allowances stated in the Contract Documents, if any. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the contract sum but not in the allowances;
- .3 whenever costs are more than or less than allowances, the contract sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner in sufficient time to avoid delay in the Work.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Superintendent must have negotiating authority for contract modifications.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at intervals as required by the Contract Documents, shall be related to the entire project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

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§ 3.10.2 The Contractor shall prepare and keep current, for the Owner's approval, a schedule of submittals that is coordinated with the Contractor's construction schedule and allows the Architect/Engineer and Owner reasonable time to review submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

§ 3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the drawings, specifications, addenda, Change Orders and other modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved shop drawings, product data, samples and similar required submittals. These shall be made available to the Owner at any time and shall be updated and submitted to the Owner as required by the Contract Documents.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a subcontractor of any tier, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples which illustrate materials, equipment or work quality and establish standards by which the Work will be judged.

§ 3.12.4 Shop drawings, product data, samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way that the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect/Engineer is subject to the limitations of Section 4.2.11. Informational submittals upon which the Architect/Engineer and Owner are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the A/E or Owner without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Owner shop drawings, product data, samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals that are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect/Engineer or Owner without action.

§ 3.12.6 By approving and submitting shop drawings, product data, samples and similar submittals, the Contractor represents that it has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of shop drawings, product data, samples or similar submittals until the respective submittal has been approved by the Owner.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Owner's approval of shop drawings, product data, samples or similar submittals unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submittal and (1) the Owner has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in shop drawings, product data, samples or similar submittals by the Owner's approval thereof.

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§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted shop drawings, product data, samples or similar submittals, to revisions other than those requested by the Owner on previous submittals. In the absence of such written notice the Owner's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall provide professional services that constitute the practice of architecture, engineering, or land surveying where such services are specifically required by the Contract Documents for a portion of the Work or where the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect/Engineer will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, shop drawings and other submittals prepared by such professional. Shop drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Owner. The Owner and the A/E shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and A/E have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this section, the A/E will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. Activities not related to the execution of the Work, unless specifically permitted by the Owner, are prohibited.

§ 3.13.2 It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration.

- .1 The Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to its own operations and the operations of all subcontractors as specified in Article 3 Section 3.3. 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 while operating to, from, and upon the airport as specified in applicable sections of the contract documents.
- .2 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, or maintenance vehicles at the airport.
- .3 When the contract requires the maintenance of vehicular traffic on an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep such road, street, or highway open to all traffic and shall provide such maintenance as may be required to accommodate traffic. The Contractor shall be responsible for the repair of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices at mutcd.fhwa.dot.gov, unless otherwise specified. 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 roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

§ 3.13.3 The Contractor shall furnish, erect, and maintain all barricades, warning signs, and markings for hazards necessary to protect the public and the work until their removal is directed by the Owner. When used during periods of darkness, such barricades, warning signs, and hazard markings shall be suitably illuminated. Unless otherwise specified, barricades, warning signs, and markings for hazards that are in the air operations area (AOAs) shall be a maximum of 18 inches high. Unless otherwise specified, barricades shall be spaced not more than 4 feet apart.

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For vehicular and pedestrian traffic, the Contractor shall furnish, erect, and maintain barricades, warning signs, lights and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices.

When the Work requires closing an air 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 advisory circular (AC) 150/5340-1, Standards for Airport Markings.

The Contractor shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stock piles, and the Contractor's parked construction equipment that may be hazardous to the operation of emergency fire-rescue or maintenance vehicles on the airport in reasonable 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 reasonable conformance to AC 150/5370-2.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove from and about the project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

§ 3.16 ACCESS TO WORK

§ 3.16.1 The Contractor shall provide the Owner and Architect/Engineer access to the Work in preparation and progress wherever located. The Contractor shall provide safe facilities for such access so the Owner and A/E may perform their functions under the Contract Documents.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

§ 3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect/Engineer harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in drawings, specifications or other documents prepared by the Owner or A/E. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner.

§ 3.18 INDEMNIFICATION

To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify, defend, and hold harmless the Owner, its Architect/Engineer (A/E), consultants, subconsultants and the officers, directors, employees, and agents of each and either of them, against and from all claims and liability arising under, by reason of or incidentally to the contract or any performance of the Work or any performance of the Work by subcontractors, their agents, and their employees, but not from the sole negligence or willful misconduct of the Owner and/or its A/E. Such

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indemnification by the Contractor and its subcontractors, their agents, and their employees shall include but not be limited to the following:

- .1 Liability or claims resulting directly or indirectly from the negligence or carelessness in the performance of the Work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission;
- .2 Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the Contractor's or subcontractor's own employees engaged in the Work resulting in actions brought by or on behalf of such employees against the Owner and/or the A/E;
- .3 Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree;
- .4 Liability or claims arising directly or indirectly from the use or manufacture of any copyrighted or non-copyrighted composition, secret process, patented or non-patented invention, computer software, article, or appliance, unless otherwise specifically stipulated in this contract;
- .5 Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the Owner, its A/E, its consultants, subconsultants and the officers, directors, employees, and agents, or any other parties;
- .6 Liabilities or claims arising directly or indirectly from willful or criminal misconduct; and,
- .7 Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the Contractor.

§ 3.18.2 The Contractor shall reimburse the Owner for all costs and expenses, (including but not limited to fees and charges of Architect/Engineer, attorneys, and other professionals and court costs including all costs of appeals) incurred by the Owner in enforcing the provisions of this section.

§ 3.18.3 The indemnification obligation under this section shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the Contractor or any such subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

§ 4.1 OWNER'S REPRESENTATIVE, AND ARCHITECT/ENGINEER

§ 4.1.1 The Owner's Representative will be the Owner's agent to the Contractor with respect to the project during construction and until the issuance of the final Certificate for Payment. The Owner's communications with the Contractor will be through the Owner's Representative, who will have full authority to act on behalf of the Owner with regard to all aspects of the construction of the project.

§ 4.1.2 Nothing contained within the Contract Documents shall create any contractual relationship between the Owner's Representative and the Contractor.

§ 4.1.3 Architect or Engineer

- .1 For purposes of this contract, the Architect or Engineer (A/E) is the person performing services on behalf of the Owner, and lawfully licensed to practice architecture or engineering, or an entity lawfully practicing architecture or engineering identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.
- .2 For purposes of the Contract Documents, references to the Architect may include sub consultants of multiple tiers who are lawfully licensed to practice disciplines included in the Work including, but not limited to civil, structural, mechanical, and electrical engineering. Similarly, references to the Engineer may include sub consultants of multiple tiers who are lawfully licensed to practice disciplines included in the Work including, but not limited to architecture, civil, structural, mechanical, and electrical engineering.
- .3 Nothing contained within the Contract Documents shall create any contractual relationship between the A/E and the Contractor.

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§ 4.2 OWNER'S REPRESENTATIVE'S ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Owner's Representative will provide administration of the Contract as described in the Contract Documents, and will be the Owner's agent (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2. The Owner's Representative will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 4.2.2 The office of the Owner's Representative will be located at or near the project site for the duration of construction. The Owner's Representative and associated staff will observe the Work (1) to monitor the progress and quality of the Work, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents, and (4) to keep the Owner informed about the progress and quality of the Work. However, the Owner's Representative will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Owner's Representative will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.

§ 4.2.3 The Owner's Representative will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Owner's Representative will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors of any tier, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner, Architect/Engineer, and Contractor shall communicate with each other through the Owner's Representative about matters arising out of, or relating to the Contract. Communications by and with the A/E's consultants shall be through the A/E. Communications by and with subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

§ 4.2.5 Upon presentation of the Contractor's Applications for Payment, the Owner's Representative will review and certify the amounts due the Contractor and will approve the Applications for Payment in such amounts.

§ 4.2.6 The Owner's Representative will have authority to reject Work that does not conform to the Contract Documents. Whenever the Owner's Representative considers it necessary or advisable, the Owner's Representative will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Owner's Representative nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Owner's Representative to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Owner's Representative will prepare Change Orders and Construction Change Directives and may authorize minor changes in the Work as provided in Section 7.4.

§ 4.2.8 The Owner's Representative will conduct inspections to determine the date or dates of Substantial Completion and the date of Final Completion, will receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor, and will approve the final Application for Payment upon compliance with the requirements of the Contract Documents.

§ 4.2.9 The Owner's Representative will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of the Owner or Contractor. The Owner's Representative's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Owner's Representative shall be furnished in compliance with this Section 4.2, then delay shall not be

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recognized on account of failure by the Owner's Representative to furnish such interpretations until 15 days after written request is made for them.

§ 4.2.10 Interpretations and decisions of the Owner's Representative will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and initial decisions, the Owner's Representative will endeavor to secure faithful performance by both Owner and Contractor.

§ 4.2.11 SERVICES OF THE ARCHITECT OR ENGINEER (A/E)

- .1 The Architect or Engineer (A/E) will provide certain contract administration services as hereinafter described.
- .2 Should errors, omissions, or conflicts in the drawings, specifications, or other contract documents provided by the A/E be discovered, the A/E will prepare such amendments or supplementary documents and provide consultation as may be required.
- .3 The A/E and its sub-consultants will visit the site at intervals appropriate to the stage of construction to familiarize themselves generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. Unless otherwise provided in the Owner-A/E Agreement, the A/E and its sub-consultants will not be required to make exhaustive or continuous on-site inspection or observations to check the quality or quantity of the Work, but they shall make as many on-site inspections and observations as may reasonably be required to fulfill their obligations to the Owner. On the basis of such on-site observation, the A/E and its sub-consultants shall endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor.
- .4 The A/E will render written field reports to the Owner in the form required by the Owner relating to the periodic visits and inspections of the Project required by Section 4.2.11.
- .5 The A/E will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and the A/E will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The A/E will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.
- .6 The A/E shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide safe facilities for such access so the A/E may perform its functions under the Contract Documents.
- .7 As required, the A/E will render to the Owner interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon.
- .8 All communications, correspondence, submittals, and documents exchanged between the A/E and the Contractor in connection with the Project shall be through or in the manner prescribed by the Owner.
- .9 All interpretations and decisions of the A/E will be consistent with the intent of and reasonably inferable from the Contract Documents.
- .10 The A/E's decision in matters relating to aesthetic effect will be final if consistent with the intent of the Contract Documents and approved by the Owner.
- .11 If the A/E observes any Work that does not conform to the Contract Documents, the A/E shall promptly report in writing this observation to the Owner. The A/E will prepare and submit to the Owner lists of the Contractor's Work that is not in conformance with the Contract Documents.
- .12 The A/E will review and make a recommendation to the Owner of appropriate action upon the Contractor's submittals such as shop drawings, product data and samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The A/E's review will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor, or separate contractors, while allowing sufficient time in the A/E's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as

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required by the Contract Documents. The A/E's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The A/E's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the A/E, of any construction means, methods, techniques, sequences or procedures. The A/E's recommendation for approval of a specific item shall not indicate recommendation of approval of an assembly of which the item is a component.

- .13 The Owner will establish procedures to be followed by the A/E for review and processing of all shop drawings, catalog submittals, project reports, test reports, maintenance manuals, and other necessary documentation.
- .14 The A/E may assist the Owner in conducting inspections to determine the dates of Substantial Completion and Final Completion, and the Owner will issue a Certificate of Substantial Completion and a Certificate of Final Completion.
- .15 In case of the termination of the A/E, the Owner may appoint an alternate person who is appropriately licensed to assume all of the services of the A/E thereafter.
- .16 If the Owner and A/E agree, the A/E may provide one or more project representatives to assist in carrying out the A/E's responsibilities at the site. Such responsibilities may include, but are not limited to inspection, testing, and specialized construction observation. The assistant project representative, inspector, or other such assigned personnel shall have no authority to interpret or direct the Work unless authorized in writing by the Owner.

§ 4.3 CLAIMS AND DISPUTES

§ 4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes all other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. All Claims must be initiated by written notice within the time limits provided in Section 4.3.2. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 4.3.2 Time Limits on Claims. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes, or should reasonably have recognized, the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to the Owner and the other party.

§ 4.3.3 Continuing Contract Performance. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7. and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site that are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than the time limits provided in 4.3.2. The Owner will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the contract sum or contract time, or both. If the Owner determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Owner shall so notify the Contractor in writing, stating the reasons, and the Claim shall be denied.

§ 4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the contract sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

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§ 4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Owner, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Owner, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Section .

§ 4.3.7 Claims for Additional Time

- .1 If the Contractor wishes to make Claim for an increase in the contract time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.
- .2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The Contractor shall, within 10 days of the beginning of any such delay, notify the Owner in writing of the cause of delay and request an extension of contract time. The Owner will ascertain the facts and the extent of the delay and extend the time for completing the Work when, in the Owner's judgment, the findings of fact justify such an extension. Unprecedented, abnormal, or unusually severe weather will be defined as an event, or events, with a greater than 50-year recurrence interval, as determined by the National Weather Service.

§ 4.3.8 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 14 days after discovery or when discovery reasonably should have been made. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 4.3.9 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 4.3.10 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business or reputation, attorney's fees and costs, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this section shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 4.4 RESOLUTION OF CLAIMS AND DISPUTES

§ 4.4.1 Decision of Owner. All Claims of this Contract shall be promptly brought to the Owner's Representative for analysis and consideration. The Contractor shall strictly follow the process outlined by the Owner for resolving claims and disputes, and shall not initiate or respond to alternative resolution processes, unless agreed to by both the Owner and the Contractor and incorporated into a Change Order. Once the Contractor has delivered a Claim, the Owner shall promptly analyze the Claim, fairly considering all aspects of the Claim in terms of the Contract Documents. The Owner shall then render an opinion in writing. The Owner will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 4.4.2 The Owner's Representative will review Claims and within fifteen days of the receipt of the Claim and take one or more of the following actions: (1) request additional supporting data from the Contractor or a response with

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supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, or (4) suggest a compromise.

§ 4.4.3 In evaluating Claims, the Owner may, but shall not be obligated to, consult with or seek information from either party, from the Architect/Engineer or from persons with special knowledge or expertise who may assist the Owner in rendering a decision. The Owner may authorize retention of such persons at the Owner's expense.

§ 4.4.4 If the Owner requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within fifteen days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Owner when the response or supporting data will be furnished or advise the Owner that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Owner will either reject or approve the Claim in whole or in part.

§ 4.4.5 The Owner will approve or reject Claims by written decision that shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Owner shall be final and binding on the parties.

§ 4.4.6 Upon receipt of a Claim against the Contractor or at any time thereafter, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 4.5 DISPUTE RESOLUTION BOARD

§ 4.5.1 If, and as provided in Supplementary General Conditions, this contract shall be subject to Dispute Resolution Board procedures.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "subcontractor" is referred to throughout the Contract Documents as if singular in number and means a subcontractor or an authorized representative of the subcontractor at any tier. The term "subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 As stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner to reply promptly shall constitute notice of no reasonable objection. Periodic submittals of the list of Subcontractors to the Owner are required. A final list of subcontractors and subcontract amounts will be required prior to Final Payment.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the contract sum and contract time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute subcontractor's Work. However, no increase in the contract sum or contract time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

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§ 5.2.4 The Contractor shall not change a subcontractor, person or entity previously selected if the Owner makes reasonable objection to such substitute.

§ 5.3 SUBCONTRACTUAL RELATIONS

§ 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each subcontractor, to the extent of the Work to be performed by the subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the subcontractor's Work, that the Contractor, by these documents, assumes toward the Owner and Architect/Engineer. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect/Engineer under the Contract Documents with respect to the Work to be performed by the subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each subcontractor to enter into similar agreements with subcontractors of all tiers. The Contractor shall make available to each proposed subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the subcontractor will be bound, and, upon written request of the subcontractor, identify to the subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed subcontractors at all tiers.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the project with the Owner's own forces, and to award separate contracts in connection with other portions of the project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.

§ 6.1.2 The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA facility, or a utility service of another government agency at any time during the progress of the Work.

Should the Owner of public or private utility service, FAA, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the Work, the Contractor shall cooperate with such Owners by arranging and performing the Work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such Work by others is listed above. When ordered as extra Work by the Owner, the Contractor shall make all necessary repairs to the Work that are due to such authorized Work by others, unless otherwise provided for in the contract. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized Work by others or for any delay to the Work resulting from such authorized Work.

§ 6.1.3 When separate contracts are awarded for different portions of the project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

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§ 6.1.4 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.5 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Owner apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner that are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

§ 6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

§ 6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Without invalidating the Contract and without notice to any surety, the Owner may at any time or from time to time, order additions, deletions, or revisions in the Work; these will be authorized by a written Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement between the Owner and the Contractor; a Construction Change Directive may be issued by the Owner and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Owner.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

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§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Owner and signed by the Owner and Contractor, stating their agreement upon all of the following:

- .1 change in the Work;
- .2 the amount of the adjustment in the contract sum including unit price quantities; and
- .3 the extent of the adjustment, if any, in the contract time.

§ 7.2.2 Methods used in determining adjustments to the contract sum may include those listed in Section 7.3.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Owner directing a change in the Work prior to agreement on adjustment, if any, in the contract sum or contract time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the contract sum and contract time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 application of adjusted unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 as provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the contract sum or contract time.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in contract sum and contract time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.6 If prior to the commencement of the Work the Contractor has not provided a lump sum price, or the Contractor and the Owner have not agreed on a lump sum price as described in Section 7.3.3, the price shall be established in one of the following ways, as determined by the Owner.

- .1 on a lump sum basis following completion of the Work. The lump sum price shall be properly itemized in accordance with Sections 7.3.7 and 7.3.8 and supported by sufficient data to permit evaluation;
- .2 on a time and material basis, with or without a maximum not-to-exceed price, at the discretion of the Owner. Costs will be accumulated on a time and material basis as described in Sections 7.3.7 and 7.3.9 and presented daily (the day after the Work is performed) for approval by the Owner on the forms provided by the Owner. The daily report will be signed by the Contractor and the Owner.

§ 7.3.7 Cost substantiation for Work proceeding on a lump sum or time and material basis. In accordance with Section 7.3.6, the Contractor shall provide a detailed breakdown of the costs as described in this section and submit the costs and substantiating data in a proposal to the Owner:

- .1 Excluded Costs. The following shall not be considered by the Owner for compensation to the Contractor:
 - A. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnership and sole proprietorships), general managers, architects, estimators, attorneys,

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- auditors, accountants, purchasing and contracting agents, expenditures, timekeepers, clerks and other personnel employed by Contractor whether at the site or in Contractor's principal or a branch office for general administration of the Work, or not specifically covered by this section, all of which are to be considered administrative costs covered by the Contractor's fee.
- B. Expenses of Contractor's principal and branch offices other than Contractor's office at the site.
 - C. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - D. Cost of premiums for all Bonds and for all insurance whether or not Contractor is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered this section).
 - E. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
 - F. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in this section.
- .2 Direct costs. These shall be limited to 1) cost of materials, as described below under "Materials," 2) cost of labor as described below under "Labor Rates," 3) rental rate including fuel and maintenance for any power tools valued at over \$3,000 and equipment as described below under "Equipment Rates," and 4) bond premiums and additional cost of Builder's Risk Insurance, at rates equal to the amount billed for the base contract or the actual rate as supported by an invoice.
- .3 Equipment Rates. The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the "Rental Rate Blue Book". Such rental rate will be used to compute payments for equipment whether the equipment is under the Contractor 's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the Owner for the total period of use. If it is deemed necessary by the Contractor to use equipment not listed in the "Rental Rate Blue Book", an equitable rental rate for the equipment will be established by the Owner. The Contractor may furnish cost data which might assist the Owner in the establishment of the rental rate.
- A. All equipment shall, in the opinion of the Owner, be in good working condition and suitable for the purpose for which the equipment is to be used.
 - B. Before construction equipment is used on the extra Work, the Contractor shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the Owner a description of the equipment and its identifying number.
 - C. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment that has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 - D. Individual pieces of equipment or tools having a replacement value of \$200 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.
 - E. Rental time will not be allowed while equipment is inoperative due to breakdowns.
 - F. Unless otherwise agreed to in writing, the Contractor will be paid for the use of equipment at the rental rate listed for such equipment specified in the current edition of "Rental Rate Blue Book" available at www3.equipmentwatch.com or contact Equipment Watch at (800) 669-3282. Rental rates for equipment not covered under this reference shall be comparable to the lowest, commercially available rental rate for similar equipment in the area of the Project
- .4 Equipment on the Project site. The rental time to be paid for equipment on the Work site shall be the time the equipment is in productive operation on the extra Work being performed and, in addition, shall include the time required to move the equipment to the location of the extra Work and return it to the original location or to another location requiring no more time than that required to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra Work, even though located at the site of the extra Work. Loading and transporting costs will

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be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the site of the extra Work on other than the extra Work. The following shall be used in computing the rental time of equipment on the Work site.

- A. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
 - B. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation.
 - C. When Owner-operated equipment is used to perform extra Work to be paid for on a time and materials basis, the Contractor will be paid for the equipment and operator, set forth as follows:
 - i. Payment for the equipment will be made in accordance with the provisions in Section 7.3.
 - ii. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workers operating similar equipment already on the Work site, or in the absence of such labor, established by collective bargaining agreements for the type of worker and location of the extra Work, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Section 7.3.7.5, herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages.
 - iii. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Sections 7.3.8 and 7.3.9.
- .5 Labor Rates. The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra Work at the time the extra Work is done, plus employer payments of payroll taxes, workers' compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers shall be paid only when such costs are not included in the invoice for equipment rental. The labor costs for forepersons shall be proportioned to all of their assigned Work and only that applicable to extra Work shall be paid. Non-direct labor costs including superintendence shall be considered part of the mark-up set out in Sections 7.3.8 and 7.3.9.
- .6 Materials. The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the job in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:
- A. Trade discounts available to the purchaser shall be credited to the Owner notwithstanding the fact that such discounts may not have been taken by the Contractor.
 - B. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the Owner. Mark-up except for actual costs incurred in the handling of such materials will not be allowed.
 - C. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra Work items or the current wholesale price for such materials delivered to the Work site, whichever price is lower.
 - D. If in the opinion of the Owner the cost of material is excessive, or the Contractor does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the Work site less trade discount. The Owner reserves the right to furnish materials for the extra Work and no claim shall be allowed by the Contractor for costs and profit on such materials.

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- .7 Specialty Work. Specialty Work is defined as that Work characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. The following shall apply in making estimates for payment for specialty Work:
- A. Any bid item of Work to be classified as Specialty Work shall be listed as such in the Supplementary General Conditions. Specialty Work shall be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the Owner, invoices for Specialty Work based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs.
 - B. When the Contractor is required to perform Work necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, the charges for that portion of the Work performed at the off-site facility may, by agreement, be accepted as Specialty Work and accordingly, the invoices for the Work may be accepted without detailed itemization.
 - C. All invoices for specialty Work will be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit specified in Sections 7.3.8 and 7.3.9, herein, an allowance of 5 percent will be added to invoices for specialty Work.
- .8 Sureties. All Work performed hereunder shall be subject to all of the provisions of the Contract Documents and the Contractor's sureties shall be bound with reference thereto as under the original Agreement. Copies of all amendments to surety Bonds or supplemental surety Bonds shall be submitted to the Owner for review prior to the performance of any Work hereunder.

§ 7.3.8 Contractor's Fee for Work proceeding on a lump sum basis. The Contractor shall apply a combined percentage rate to the direct costs to compensate the Contractor for additional overhead and profit associated with a Change in the Work. The combined rate to the Owner of any change shall not exceed the rates set forth in the following schedule:

- .1 For the Contractor, for Work performed by the Contractor's own forces, up to fifteen percent (15%) of direct costs.
- .2 For each subcontractor, for Work performed by the subcontractor's forces, up to fifteen percent (15%) of direct costs.
- .3 For the Contractor, for work performed by subcontractors, up to ten percent (10%) of the Subcontractors direct costs.
- .4 For the subcontractor, for Work performed by subcontractors of all tiers, up to ten percent (10%) of the sub-subcontractor's direct costs.
- .5 The total Contractor and all subcontractors' overhead and profit allowance shall not exceed twenty-five percent (25%) of direct costs.
- .6 To the sum of the costs and Contractor fees provided for in this section, one percent (1%) shall be added as compensation for bonds.

§ 7.3.9 Contractor's Fee for Work proceeding on a time and materials basis. The Contractor shall apply a combined percentage rate to the direct costs to compensate the Contractor for additional overhead and profit associated with a Change in the Work. The combined rate to the Owner of any change shall not exceed the rates set forth in the following schedule:

- .1 For the Contractor, for Work performed by the Contractor's own forces, up to ten percent (10%) of direct costs.
- .2 For each subcontractor, for Work performed by the subcontractor's forces, up to ten percent (10%) of direct costs.
- .3 For the Contractor, for work performed by subcontractors, up to five percent (5%) of the subcontractors direct costs.
- .4 For the subcontractor, for Work performed by subcontractors of all tiers, up to five percent (5%) of the sub-subcontractor's direct costs.
- .5 The total Contractor and all subcontractors' overhead and profit allowance shall not exceed twenty percent (20%) of direct costs.
- .6 To the sum of the costs and Contractor fees provided for in this section, one percent (1%) shall be added as compensation for bonds.

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§ 7.3.10 Adjustment of Quantities. The Owner is authorized to make such adjustments in the Work as may increase or decrease the originally awarded contract quantities of unit price components, provided that the aggregate of such adjustments does not change the total contract cost or the total cost of any major contract item by more than 25% (total cost being based on the unit prices and estimated quantities in the awarded contract). Alterations that do not exceed the 25% limitation shall not invalidate the contract nor release the surety, and the Contractor agrees to accept payment for such alterations in accordance with the unit price offered in the bid.

§ 7.3.11 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Owner. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.12 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in applications for payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Owner will make an interim determination for purposes of monthly approval of payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.

§ 7.3.13 When the Owner and Contractor agree with the adjustments in the contract sum and contract time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

§ 7.4 MINOR CHANGES IN THE WORK

§ 7.4.1 The Owner may order minor changes in the Work not involving adjustment in the contract sum or extension of the contract time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Owner in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.1.5 The term non-working day as may be used in the Contract Documents shall mean Sunday, a recognized holiday, a day on which the Contractor is specifically required to suspend construction operations or a day on which a suspension order is in effect. The legal holidays of the City & Borough of Juneau occur on:

- .1 New Year's Day - January 1
- .2 Martin Luther King's Birthday - Third Monday in January
- .3 President's 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 and the following Friday in November

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.11 Christmas Day - December 25

If any holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal holidays. If the holiday should fall on a Sunday, Sunday and the following Monday are both legal holidays.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the contract time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the contract time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect/Engineer, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner dispute resolution, or by other causes that the Owner determines may justify delay, then the contract time shall be extended by Change Order for such reasonable time as the Owner may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Section 4.3.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 BASIS OF PAYMENT

§ 9.2.1 Prior to the Preconstruction Conference, as required by the Contract Documents, the Contractor shall submit to the Owner a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Owner may require, and in accordance with other provisions of the Contract Documents. This schedule, unless objected to by the Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment.

- .1 Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows: (a) with first pay request, 25%; (b) when 25% or more of the original contract is earned, an additional 25%; (c) when 50% or more of the original contract is earned, an additional 40%; (d) after Final Inspection, staging area clean-up and delivery of all Project Closeout materials, the final 10%.

§ 9.2.2 For Unit Price contracts, all work completed under the contract will be measured by the Owner using United States Customary Units of Measurement or the International System of Units. The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

- .1 Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of

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- 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the Owner.
- .2 Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
 - .3 Unless otherwise specified, all contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.
 - .4 In computing volumes of excavation the average end area method or other acceptable methods will be used.
 - .5 The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
 - .6 The term “ton” will mean the short ton consisting of 2,000 lb avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, approved scales by competent, qualified personnel at locations designed by the Owner. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the Owner directs.
 - .7 Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
 - .8 When requested by the Contractor and approved by the Owner in writing, material specified to be measured by the cubic yard may be weighed, and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Owner and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.
 - .9 Bituminous materials will be measured by the gallon or ton. When measured by volume, such volumes will be measured at 60°F or will be corrected to the volume at 60°F using ASTM D1250 for asphalts or ASTM D633 for tars.
 - .10 When bituminous materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, may be used for computing quantities.
 - .11 Cement will be measured by the ton or hundredweight.
 - .12 Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
 - .13 The term “lump sum” when used as an item of payment will mean complete payment for the Work described in the contract. When a complete structure or structural unit (in effect, “lump sum” Work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.
 - .14 Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the Work.
 - .15 When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, 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.
 - .16 Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Scales shall be accurate within 1/2% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the inspector before beginning Work and at such other times as requested by the Owner. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed one-tenth of 1% of the nominal rated capacity of the scale, but not less than 1 pound. The use of spring balances will not be permitted. Scales must be tested for accuracy and serviced before use at a new site. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this

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subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.

§ 9.2.3 When the estimated quantities for a specific portion of the Work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the Work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the Owner. If revised dimensions result in an increase or decrease in the quantities of such Work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 On a monthly basis, the Contractor shall submit to the Owner an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be supported by such data substantiating the Contractor's right to payment as the Owner may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents.

- .1** As provided in Section 7.3.12, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of the Owner, but not yet included in Change Orders.
- .2** Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.
- .3** The Contractor may be required, through other provisions of the Contract Documents, to submit additional reports or documents with the application.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, partial payment may similarly be made for materials and equipment suitably stored off the site at a location in Juneau agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 APPROVAL OF APPLICATIONS FOR PAYMENT

§ 9.4.1 The Owner will, within seven days after receipt of an acceptable Application for Payment from the Contractor, either issue approval of such amount as properly due, or notify the Contractor in writing of the reasons for withholding approval in whole or in part as provided in Section 9.5.

§ 9.4.2 The approval of an Application for Payment will constitute a representation by the Owner, based on the Owner's evaluation of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Owner's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Owner. The approval of an Application for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the approval of an Application for Payment will not be a representation that the Owner has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

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§ 9.4.3 The Owner may refuse to make payment of the full amount because claims have been made against the Owner or the Using Agency on account of the Contractor's performance of the Work or Liens have been filed in connection with the Work or there are other items entitling the Owner to a credit against the amount recommended, but the Owner or the Using Agency, acting through the Owner's Representative, must give the Contractor written notice within 7 days stating the reasons for such action.

§ 9.5 DECISIONS TO WITHHOLD APPROVAL OF APPLICATIONS FOR PAYMENT

§ 9.5.1 The Owner may withhold approval of Applications for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Owner's opinion the representations required by Section 9.4.2 cannot be made. If the Owner is unable to approve payment in the amount of the Application, the Owner will notify the Contractor as provided in Section 9.4.1. If the Contractor and Owner cannot agree on a revised amount, the Owner will promptly issue an approval for the amount for which the Owner is able to make such representations. The Owner may also withhold approval of an Application for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of an approval previously issued, to such extent as may be necessary in the Owner's opinion to protect from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or another contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding approval are removed, approval will be made for amounts previously withheld.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Owner has approved an application for payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents.

§ 9.6.2 The Contractor shall promptly pay each subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such subcontractor's portion of the Work, the amount to which said subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each subcontractor, require each subcontractor to make payments to subcontractors at all tiers in a similar manner.

§ 9.6.3 The Owner will, on request, furnish to a subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner on account of portions of the Work done by such subcontractor.

§ 9.6.4 The Owner shall not have an obligation to pay or to see to the payment of money to a subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 Approval of an application for payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the contract sum, payments received by the Contractor for Work properly performed by subcontractors and suppliers shall be held by

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the Contractor for those subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If the Owner does not approve an application for payment or notify the Contractor that such approval will be withheld, through no fault of the Contractor, within seven days after receipt of the Contractor's application for payment, or if the Owner does not pay the Contractor within thirty days after the date established in the Contract Documents the amount approved, then the Contractor may, upon seven additional days' written notice to the Owner, stop the Work until payment of the amount owing has been received. The contract time shall be extended appropriately and the contract sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and an official Certificate of Occupancy has been issued by the authority having jurisdiction.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof that the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. The Contractor shall allow a minimum of two working days for this inspection. If the Owner's inspection discloses any item, whether or not included on the Contractor's list that is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner. In such case, the Contractor shall then submit a request for another inspection by the Owner to determine Substantial Completion. In the event that a third or subsequent inspection is required, the Owner reserves the right to charge the Contractor for the cost of such inspections.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Owner will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the applicable insurer and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the

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Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Owner as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Owner.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. No portion of the Work may be opened by the Contractor for public use until ordered by the Owner in writing. Should it become necessary to open a portion of the Work to public traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the Owner, such portion of the Work is in an acceptable condition to support the intended traffic or activity. Temporary or intermittent openings for airfield traffic (aircraft and vehicles) are considered to be inherent in the work and shall not constitute either acceptance of the portion of the Work so opened or a waiver of any provision of the contract. Any damage to the portion of the Work so opened that is not attributable to traffic or activity that is permitted by the Owner shall be repaired by the Contractor at its own expense.

The Contractor shall make its own estimate of the inherent difficulties involved in completing the Work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner, the Architect/Engineer, and the Using Agency will promptly make such inspection and, when the Owner finds the Work acceptable under the Contract Documents and the Contract fully performed, the Owner will promptly approve the final Application for Payment stating that to the best of the Owner's knowledge, information and belief, and on the basis of the aforementioned on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents. After acceptance of the Work by the Owner, the Owner will make final payment to the Contractor of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:

- .1** Liquidated damages, as applicable, and described within the Agreement.
- .2** If items of Work are determined by the Owner to have been left uncompleted or uncorrected between the date of Substantial Completion and the date of Final Completion, and the Owner decides to issue a Certificate of Final Completion leaving those Work items incomplete or uncorrected, the following deduction may be made from the final payment: Two times the value of outstanding items of correction Work or Substantial Completion list items yet uncompleted or uncorrected, as applicable. The Contractor does hereby waive any and all claims to all monies withheld by the Owner to cover the value of all such uncompleted or uncorrected items.

The Owner's approval of the final Application for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project, and (6) if required by the Owner, other data establishing payment or satisfaction of

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obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Owner so confirms, the Owner shall, upon application by the Contractor and approval by the Owner and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Owner prior to approval of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

§ 9.10.6 Release Of Retainage And Other Deductions. After executing the necessary documents to initiate the lien period, and not more than 45 days thereafter (based on a 30-day lien filing period and 15-day processing time), the Owner will release to the Contractor the retainage funds withheld pursuant to the Contract, less any deductions to cover pending claims against the Owner or Using Agency pursuant to Section 9.4.3.

- .1 After filing of the necessary documents to initiate the lien period, the Contractor shall have 30 days to complete any outstanding items of correction Work remaining to be completed or corrected as listed on a final punch list made a part of the Notice of Final Completion. Upon expiration of the 45 days, referred to in Section 9.10.6, the amounts withheld pursuant to the provisions of Section 9.10.1 herein, for all remaining Work items will be returned to the Contractor; provided, that said Work has been completed or corrected to the satisfaction of the Owner within said 30 days. Otherwise, the Contractor does hereby waive any and all claims for all monies withheld by the Owner under the Contract to cover two times the value of such remaining uncompleted or uncorrected items.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off site, under care, custody or control of the Contractor or the Contractor's subcontractors of all tiers; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

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§ 10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

- .1 Unless otherwise specified in this subsection, the Contractor is advised that the site of the Work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior. Should the Contractor encounter, during its operations, any part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the Owner. The Owner will immediately investigate the Contractor's finding and direct the Contractor to either resume operations or to suspend operations as directed. Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra Work, such shall be covered by an appropriate contract change order.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions, performance of the Contract, and regulatory agencies, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

- .1 All Contractors' operations shall be conducted in accordance with the project Construction Safety and Phasing Plan (CSPP) and the provisions set forth within the current version of AC 150/5370-2. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a Safety Plan Compliance Document that details how it proposes to comply with the requirements presented within the CSPP.
- .2 The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures. No deviation or modifications may be made to the approved CSPP unless approved in writing by the Owner.

§ 10.2.4 When use or storage of hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. A Material Safety Data Sheet shall be requested by the Contractor from the manufacturer of any hazardous product used, and material usage shall be accomplished with strict adherence to all safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label. The Contractor shall be responsible for coordinating communications on any exchange of Material Safety Data Sheets or other hazardous material information that is required to be made available to, or exchanged between, or among, employers at the site in accordance with Laws or Regulations.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a subcontractor of any tier, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect/Engineer or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a qualified and responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be approved by the Owner.

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB),

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encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner in writing.

§ 10.3.2 The Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor will promptly reply to the Owner in writing stating whether or not the Contractor has reasonable objection to the persons or entities proposed by the Owner. If the Contractor has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor has no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

§ 10.3.3 The Owner shall not be responsible under Section 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

§ 10.3.4 If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 ENVIRONMENTAL PROTECTION

§ 10.4.1 The Contractor shall comply with all Federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

§ 10.4.2 The Contractor shall control storm water in accordance with current Alaska Department of Environmental Conservation Construction General Permit requirements for storm water control, and as described elsewhere in the contract documents.

§ 10.5 EMERGENCIES

§ 10.5.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Section 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 INSURANCE

§ 11.1.1 The Contractor shall purchase and maintain the insurance required under this section. Such insurance shall include the specific coverages set out herein and be written for not less than the limits of liability and coverages provided in the Supplementary General Conditions, or required by law, whichever are greater. All insurance shall be maintained continuously during the life of the Agreement up to the date of Final Completion and at all times thereafter when the Contractor may be correcting, removing, or replacing defective Work in accordance with Section 12.2, but the Contractor's liabilities under this Contract shall not be deemed limited in any way to the insurance coverage required. Policies shall also specify insurance provided by Contractor will be considered primary and not contributory to any other insurance available to the Owner. **Failure by the Contractor to keep such insurance in effect for the time period specified shall be deemed defective Work and resolved in accordance with the Contract Documents.**

§ 11.1.2 All insurance required by the Contract Documents to be purchased and maintained by the Contractor shall be obtained from insurance companies that are duly licensed or authorized in the State of Alaska to issue insurance policies for the limits and coverages so required. Such insurance companies shall have a current Best's Rating of at

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least an "A" (Excellent) general policy holder's rating and a Class VII financial size category and shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

§ 11.1.3 The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. At least 30 days prior to the cancellation, non-renewal or reduction in the amount of coverage, Contractor shall provide written notice to the Owner. **All such insurance required herein (except for Workers' Compensation and Employer's Liability) shall name the Owner, Using Agency, their Consultants and subconsultants and their officers, directors, agents, and employees as "additional insureds" under the policies.** The Contractor shall purchase and maintain the following insurance:

- .1 Workers' Compensation and Employer's Liability. This insurance shall protect the Contractor against all claims under applicable state Workers' Compensation laws. The Contractor shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a Workers' Compensation law. This policy shall include an "all states" endorsement. The Contractor shall require each Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workers' Compensation Insurance. In case any class of employees is not protected, under the Workers' Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected. **Contractor agrees to waive all rights of subrogation against the Owner for work performed under Contract.**

Note: If the Work called for in the Contract Documents involves work in or on any navigable waters, the Contractor shall provide Workers' Compensation coverage which shall include coverage under the Longshore and Harbor Workers' Compensation Act, the Jones Act, and any other coverage required under Federal or State laws pertaining to workers in or on navigable waters.

- .2 Commercial General Liability. This insurance shall be written in comprehensive form and shall protect the Contractor against all claims arising from injuries to persons other than its employees or damage to property of the Owner or others arising out of any act or omission of the Contractor or its agents, employees, or Subcontractors. The policy shall contain no exclusions for any operations within the scope of this Contract.
- .3 Comprehensive Automobile Liability. This insurance shall be written in comprehensive form and shall protect the Contractor against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, and shall cover operation on or off the site of all motor vehicles licensed for highway use, whether they are owned, non-owned, or hired. Coverage for hired motor vehicles should include endorsement covering liability assumed under this Contract.
- .4 Subcontractor's Insurance. The Contractor shall require and verify that each of its subcontractors maintain insurance meeting all of the requirements stated herein, unless specifically exempted from a required coverage. Subcontractor insurance coverage shall be of the type and in the amounts specified in the Supplementary General Conditions or Contractor shall insure the activities of its Subcontractors under the Contractor's own policy, in like amount.
- .5 Builder's Risk. This insurance shall be of the "all risks" type and shall be written in completed value form, and shall protect the Contractor, the Owner, and the Using Agency against risks of damage to buildings, structures, and materials and equipment. The amount of such insurance shall be not less than the insurable value of the Work at completion. Builder's risk insurance shall provide for losses to be payable to the Contractor, the Owner, and the Using Agency, as their interests may appear. The policy shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the Contractor, the Owner, and the Using Agency. The Builder's Risk policy shall insure against risks of direct physical loss or damage to property from any external cause. Allowable exclusions, if any, shall be as specified in the Supplementary General Conditions.

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§ 11.2 PERFORMANCE BOND AND PAYMENT BOND

§ 11.2.1 The Contractor shall furnish performance and payment bonds, each in the amount set forth in the Supplementary General Conditions as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. These bonds shall remain in effect at least until one year after the date of Substantial Completion except as otherwise provided by Law or Regulation or by the Contract Documents. The Contractor shall also furnish such other Bonds as are required by the Supplementary General Conditions. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by laws or regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

§ 11.2.2 If the surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Work is located, the Contractor shall within 7 days thereafter substitute another bond and surety, which must be acceptable to the Owner.

§ 11.2.3 All Bonds required by the Contract Documents to be purchased and maintained by Contractor shall be obtained from surety companies that are duly licensed or authorized in the State of Alaska to issue bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Owner's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner, be uncovered for the Owner's examination and be replaced at the Contractor's expense without change in the contract time.

§ 12.1.2 If a portion of the Work has been covered that the Owner has not specifically requested to examine prior to its being covered, the Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 Before or after Substantial Completion. The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and compensation for the Owner's and Architect's/Engineer's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, work quality, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier. If, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, the Owner may correct it in accordance with Section 2.4.

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§ 12.2.3 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

§ 12.2.4 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.5 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.6 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

§ 12.2.7 Nothing contained in this section shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

§ 12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the contract sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the law of the State of Alaska. The Contractor shall observe and comply with all federal, state, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the Work, the materials used in the Work, or the conduct of the Work. If any discrepancy or inconsistency should be discovered in this Contract in relation to any such law, ordinance, code, order, or regulation, the Contractor shall report the same in writing to the Owner. The Contractor shall indemnify, defend, and hold harmless the Owner, the Using Agency, and their officers, agents, and employees against all claims or liability arising from violation of any such law, ordinance, code, or regulation, whether by Contractor or by its employees, Subcontractors, or third parties. Any particular law or regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the Contractor to comply with all other provisions of federal, state, and local laws and regulations.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.3 WRITTEN NOTICE

§ 13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

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§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect/Engineer or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Owner timely notice of when and where tests and inspections are to be made so that the Owner may be present for such procedures. The Owner shall bear costs of tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded.

§ 13.5.2 If the Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Owner will instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Owner of when and where tests and inspections are to be made so that the Owner may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Owner's and Architect's/Engineer's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Owner.

§ 13.5.5 If the Owner is to observe tests, inspections or approvals required by the Contract Documents, the Owner will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5.7 For Airport Improvement Program (AIP) contracts, the United States Government has agreed to reimburse the Owner for some portion of the Contract costs. Such reimbursement is made from time to time upon the Owner's request to the FAA. In consideration of the United States Government's (FAA's) agreement with the Owner, the Owner has included provisions in this contract pursuant to the requirements of Title 49 of the USC and the Rules and Regulations of the FAA that pertain to the work.

As required by the USC, the contract Work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator, and is further subject to those provisions of the rules and regulations that are cited in the Contract, plans, or specifications.

No requirement of the USC, the rules and regulations implementing the USC, or this Contract shall be construed as making the Federal Government a party to the Contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

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§ 13.6 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

§ 13.6.1 As between the Owner and Contractor:

- .1 Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
- .2 Between Substantial Completion and Final Completion. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to the date of Final Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of Final Completion; and
- .3 After Final Completion. As to acts or failures to act occurring after the relevant date of Final Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

§ 13.7 RETENTION AND INSPECTION OF RECORDS

§ 13.7.1 Record Retention and Maintenance. The Contractor shall keep and maintain in safe condition full and accurate records of all costs incurred and items billed and all other project records and documents relating to performance, communications, and correspondence in connection with the performance of the Work under this Contract, which records and documents shall be open to review, examination, reproduction or audit by the Owner or its authorized representatives during performance of the Work and until three years after final payment and all other pending matters are closed.

§ 13.7.2 Subcontractor Records. The Contractor shall make it a condition of all subcontracts of all tiers relating to the Work under this Contract that any and all subcontractors of all tiers will keep accurate records of costs incurred and items billed in connection with their Work and that such records shall be open to review, examination, reproduction or audit by the Owner or its authorized representatives during performance of the Work and until three years after final payment under the subcontract and all other pending matters are closed.

§ 13.7.3 Availability. The Contractor shall make available at its business office upon request at all reasonable times the materials described in Sections 2.5 including materials of both the Contractor and its subcontractors, for review, examination, reproduction, or audit for a period of three years after final payment under this Contract and all other pending matters are closed.

§ 13.7.4 Termination. If this Contract is completely or partially terminated, the records relating to the Work terminated shall be made available for three years after any resulting final termination settlement.

§ 13.7.5 Claims and Appeals. Records pertaining to any Claims or appeals submitted pursuant to Sections 4.3, 4.4 and 4.5 or otherwise arising from or relating to the performance of Work under this Contract shall be made available until such appeals are finally concluded. Such documents or records shall be made available to the Owner or its duly authorized representatives within thirty days of the Owner's request.

§ 13.7.6 Subcontracts. The Contractor shall include the provisions of Section 13.8 in all subcontracts so as to be binding on all subcontractors.

§ 13.7.7 Cost or Pricing Data. If the Contractor has submitted cost or pricing data in connection with the pricing of any Change Order or modification to this Contract, unless pricing was based on (1) adequate price competition, (2) established catalog or market price of commercial items sold in substantial quantities to the general public, or (3) prices set by law or regulation, the Owner shall have the right to audit all books, records, documents and other data of the Contractor, including computations and projections, related to negotiating, pricing or performing the Change Order or modification, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data.

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§ 13.8 GRATUITY AND CONFLICT OF INTEREST

§ 13.8.1 The Contractor agrees to not extend any loan, gratuity or gift of money of any form whatsoever to any employee or elected official of the City and Borough of Juneau or the Using Agency, nor will the Contractor rent or purchase any equipment or materials from any employee or elected official of the City and Borough of Juneau or the Using Agency, or to the best of the Contractor's knowledge, from any agent of any employee or elected official of the City and Borough of Juneau or the Using Agency. Before Final Payment, the Contractor shall execute and furnish the Owner an affidavit certifying that the Contractor has complied with the above provisions of the Contract.

§ 13.9 COST REDUCTION INCENTIVE

§ 13.9.1 At any time within 30 days after the date of the Notice of Award, the Contractor may submit to the Owner in writing, proposals for modifying the drawings, specifications, or other requirements of this Contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair in any manner the essential functions or characteristics of the project, including but not limited to, service life, economy of operation, ease of maintenance, desired appearance or design and safety standards.

§ 13.9.2 The cost reduction proposal shall contain the following information:

1. Description of both the existing Contract requirements for performing the Work and the proposed changes.
2. An itemization of the Contract requirements that must be changed if the proposal is adopted.
3. A detailed estimate of the time required and the cost of performing the Work under both the existing Contract and the proposed change.
4. A statement of the date by which the Contractor must receive the decision from the Owner on the cost reduction proposal.
5. The Contract items of Work affected by the proposed changes including any quantity variations.
6. A description and estimate of costs the Owner may incur in implementing the proposed changes, such as test and evaluation and operating and support costs.
7. A prediction of any effects the proposed change would have on future operations and maintenance costs to the Owner.

§ 13.9.3 The provisions of this section shall not be construed to require the Owner to consider any cost reduction proposal that may be submitted; nor will the Owner be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted, or for delays to the Work attributable to the consideration or implementation of any such proposal.

§ 13.9.4 If a cost reduction proposal is similar to a change in the drawings or specifications for the project under consideration by the Owner at the time the proposal is submitted, the Owner will not accept such proposal and reserves the right to make such changes without compensation to the Contractor under the provisions of this section.

§ 13.9.5 The Contractor shall continue to perform the Work in accordance with the requirements of the Contract until an executed Change Order incorporating the cost reduction proposal has been issued. If any executed Change Order has not been issued by the date upon which the Contractor's cost reduction proposal specifies that a decision should be made by the Owner, in writing, the cost reduction proposal shall be considered rejected.

§ 13.9.6 The Owner shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in Contract Time and construction costs resulting from the adoption of all or any part of such proposal. Should the Contractor disagree with Owner's decision on the cost reduction proposal, there is no further consideration. The Owner reserves the right to make final determination.

§ 13.9.7 If the Contractor's cost reduction proposal is accepted in whole or in part, such acceptance will be made by a Contract Change Order that specifically states that the change is executed pursuant to this cost reduction proposal section. Such Change Order shall incorporate the changes in the drawings and specifications that are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect and shall include any conditions upon which the Owner's approval is based, if such approval is conditional. The Change Order shall also describe the estimated net savings in the cost of performing the Work attributable to the cost reduction proposal, and shall further provide that the Contract cost be adjusted by crediting the Owner with the estimated net savings amount.

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§ 13.9.8 Acceptance of the cost reduction proposal and performance of the Work does not extend the time of completion of the Contract, unless specifically provided in the Change Order authorizing the use of the submitted proposal. Should the adoption of the cost reduction proposal result in a contract time savings, the total contract time may be reduced by an amount equal to the time savings realized.

§ 13.9.9 The amount specified to the Contractor in the Change Order accepted in the cost reduction proposal shall constitute full compensation for the performance of Work. No claims for additional costs as a result of the changes specified in the cost reduction proposal shall be allowed.

§ 13.9.10 The Owner reserves the right to adopt and utilize any approved cost reduction proposal for general use on any Contract administered when it is determined suitable for such application. Cost reduction proposals identical, similar, or previously submitted will not be accepted for consideration if acceptance and compensation has previously been approved. The Owner reserves the right to use all or part of any cost reduction proposal without obligation or compensation of any kind to the Contractor.

§ 13.9.11 The Contractor shall bear the costs, if any, to revise all bonds and insurance requirements for the project, to include the cost reduction Work.

§ 13.10 USE OF THE CBJ GRAVEL PIT

§ 13.10.1 The City and Borough of Juneau (CBJ) may make unclassified material available to Contractor, from the CBJ gravel pit, at a rate less than that charged to other customers. Contractor is not required to use material from the CBJ gravel pit and the CBJ makes no guarantee as to the quantity or quality of the available material.

§ 13.10.2 If Contractor proposes to use material from the CBJ gravel pit, Contractor must meet all requirements for use of the CBJ gravel pit as determined by the CBJ Engineering Department, Gravel Pit Management. Additional information is available at (907) 586-0884.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a subcontractor, sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 an act of government, such as a declaration of national emergency that requires all Work to be stopped; or
- .3 because the Owner has not approved an application for payment and has not notified the Contractor of the reason for withholding approval as provided in Section 9.4, or
- .4 because the Owner has not made payment on an approved application for payment within the time stated in the Contract Documents.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a subcontractor of any tier, or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

§ 14.1.4 If the Work is stopped for a period of 90 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract

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with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- .1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 accept assignment of subcontracts pursuant to Section 5.4; and
- .3 finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's/Engineer's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner shall be certified by the Owner upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or directed by the Owner, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

END OF SECTION

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SGC 1: ADD the following to § 1.7 FEDERAL CONTRACT PROVISIONS

§ 1.7.1 ACCESS TO RECORDS AND REPORTS. (2 CFR § 200.326, 2 CFR § 200.333) The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Sponsor, the Federal Aviation Administration, and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

§ 1.7.2 BUY AMERICAN PREFERENCES. (49 USC § 50101) The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP-funded projects are produced in the United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list. The appropriate Buy American Certification presented with the Bid shall be fulfilled through the execution of the Work.

§ 1.7.3 CIVIL RIGHTS – GENERAL. (49 USC § 47123) The Contractor agrees that it will comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision binds the Contractor from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

§ 1.7.4 TITLE VI CLAUSES FOR COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS. (49 USC § 47123) During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”) agrees as follows:

1. Compliance with Regulations: The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Statutes and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. Non-discrimination: The Contractor, with regard to the Work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Contractor for Work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor’s obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. Information and Reports: The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the sponsor of the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. Sanctions for Noncompliance: In the event of a Contractor’s noncompliance with the Non- discrimination provisions of this contract, the sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:
 - a. Withholding payments to the Contractor under the contract until Contractor complies; and/or
 - b. Cancelling, terminating, or suspending a contract, in whole or in part.
6. Incorporation of Provisions: The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the

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Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

§ 1.7.5 TITLE VI PERTINENT NONDISCRIMINATION ACTS AND AUTHORITIES. (49 USC § 47123)

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation - Effectuation of Title VI of The Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 *et seq.*).

§ 1.7.6 DISADVANTAGED BUSINESS ENTERPRISE. (49 CFR part 26) The requirements of 49 CFR part 26 apply to this contract. It is the policy of the Juneau International Airport and the City and Borough of Juneau to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

- 1 Contract Assurance (§ 26.13) – 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 DOT assisted contracts.

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Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate.

- .2 Prompt Payment (§26.29) - The prime Contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the City and Borough of Juneau. The prime Contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City and Borough of Juneau. This clause applies to both DBE and non-DBE subcontractors.

§ 1.7.7 ENERGY CONSERVATION REQUIREMENTS. (2 CFR § 200, Appendix II(H)) Contractor and Subcontractor agree to comply with mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201 *et seq.*)

§ 1.7.8 FEDERAL FAIR LABOR STANDARDS ACT. (29 U.S.C. § 201, *et seq.*) All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part time workers. The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

§ 1.7.9 OCCUPATIONAL SAFETY AND HEALTH ACT. (20 CFR part 1910) All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The Contractor retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

§ 1.7.10 VETERAN'S PREFERENCE. (49 USC § 47112(c) In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the Work to which the employment relates.

§ 1.7.11 COPELAND ANTI – KICKBACK ACT. (2 CFR § 200, Appendix II(D), 29 CFR Parts 3 & 5) Contractor must comply with the requirements of the Copeland “Anti-Kickback” Act (18 U.S.C. 874 and 40 U.S.C. 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered Work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

§ 1.7.12 DAVIS-BACON REQUIREMENTS. (2 CFR § 200, Appendix II(D), 29 CFR Part 5)

.1 Minimum Wages

- (i) All laborers and mechanics employed or working upon the site of the Work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

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Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing Work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, that the employer's payroll records accurately set forth the time spent in each classification in which Work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the Work in a prominent and accessible place where it can easily be seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The Work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *provided*, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

.2 Withholding. The Federal Aviation Administration or the sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime

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- Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
- .3 Payrolls and basic records.
- (i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the Work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the Work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (*e.g.*, the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime Contractor to require a subcontractor to provide addresses and social security numbers to the prime Contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or Owner).
- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i) and that such information is correct and complete;
- (2) That each laborer and mechanic (including each helper, apprentice and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either

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directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of Work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying or transcription by authorized representatives of the sponsor, the Federal Aviation Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, sponsor, applicant or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified

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- in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR Part 30.
- .5 Compliance with Copeland Act Requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.
- .6 Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.
- .7 Contract Termination: Debarment. A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
- .8 Compliance With Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
- .9 Disputes Concerning Labor Standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
- .10 Certification of Eligibility.
- (i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

§ 1.7.13 DISTRACTED DRIVING. (Executive Order 13513, DOT Order 3902.10) In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving" (10/1/2009) and DOT Order 3902.10 "Text Messaging While Driving" (12/30/2009), the FAA encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or sub-grant.

In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500 and involve driving a motor vehicle in performance of work activities associated with the project.

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§ 1.7.14 **EQUAL OPPORTUNITY.** (2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, 41 CFR § 60-4.3, part 60-4, Executive Order 11246) During the performance of this contract, the contractor agrees as follows:

- .1 The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identify or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- .2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- .3 The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- .4 The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- .5 The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- .6 In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- .7 The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *provided, however*, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

§ 1.7.15 **EQUAL OPPORTUNITY SPECIFICATIONS.** (2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, 41 CFR § 60-4.3, part 60-4, Executive Order 11246)

1. As used in these specifications:

- a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
- d. "Minority" includes:

(1) Black (all) persons having origins in any of the Black African racial groups not of Hispanic origin);

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(2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);

(3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the Work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the contractor during the training period and the contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

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- c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such a superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

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8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally,) the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

§ 1.7.16 PROHIBITION AGAINST SEGREGATED FACILITIES. (41 CFR 60)

(a) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(b) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the

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basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user restrooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

§ 1.7.17 PROCUREMENT OF RECOVERED MATERIALS. (2 CFR § 200.322, 40 CFR part 247) Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors are to use of products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

- a) The contract requires procurement of \$10,000 or more of a designated item during the fiscal year; or,
- b) The contractor has procured \$10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at www.epa.gov/epawaste/consERVE/tools/cpg/products.

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the Contractor can demonstrate the item is:

- a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
- b) Fails to meet reasonable contract performance requirements; or
- c) Is only available at an unreasonable price.

§ 1.7.18 TERMINATION OF CONTRACT FOR CONVENIENCE. (2 CFR § 200 Appendix II(B), FAA Advisory Circular 150/5370-10, Section 80-09) The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

- .1 Contractor must immediately discontinue Work as specified in the written notice.
- .2 Terminate all subcontracts to the extent they relate to the Work terminated under the notice.
- .3 Discontinue orders for materials and services except as directed by the written notice.
- .4 Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed Work, supplies, equipment and materials acquired prior to termination of the Work and as directed in the written notice.
- .5 Complete performance of the Work not terminated by the notice.
- .6 Take action as directed by the Owner to protect and preserve property and Work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

- a) completed and acceptable Work executed in accordance with the contract documents prior to the effective date of termination;
- b) documented expenses sustained prior to the effective date of termination in performing Work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;
- c) reasonable and substantiated claims, costs and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and
- d) reasonable and substantiated expenses to the Contractor directly attributable to Owner's termination action.

Owner will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the Owner's termination action. The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this contract.

§ 1.7.19 TERMINATION OF CONTRACT FOR DEFAULT. Section 80-09 of FAA Advisory Circular 150/5370-10 establishes conditions, rights and remedies associated with Owner termination of this contract due default of the Contractor.

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§ 1.7.20 DEBARMENT AND SUSPENSION. (2 CFR part 180 (Subpart C), 2 CFR part 1200, DOT Order 4200.5) The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a “covered transaction”, must verify each lower tier participant of a “covered transaction” under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

- .1 Checking the System for Award Management at website: <http://www.sam.gov>
- .2 Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.
- .3 Inserting a clause or condition in the covered transaction with the lower tier contract. If the FAA later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

§ 1.7.21 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT. (2 CFR § 200, Appendix II(E))

- .1 Overtime Requirements. No Contractor or subcontractor contracting for any part of the contract Work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such Work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- .2 Violation; Liability for Unpaid Wages; Liquidated Damages. In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.
- .3 Withholding for Unpaid Wages and Liquidated Damages. The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this clause.
- .4 Subcontractors. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

§ 1.7.22 BREACH OF CONTRACT. (2 CFR part 200, Appendix II(A)) Any violation or breach of terms of this contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement. Owner will provide Contractor written notice that describes the nature of the breach and corrective actions the Contractor must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner’s notice will identify a specific date by which the Contractor must correct the breach. Owner may proceed with termination of the contract if the Contractor fails to correct the breach by deadline indicated in the Owner’s notice. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

§ 1.7.23 CLEAN AIR/WATER POLLUTION CONTROL. (2 CFR § 200, Appendix II(G)) Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). The Contractor agrees to

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report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration. Contractor must include this requirement in all subcontracts that exceeds \$150,000.

SGC 2: INSURANCE AMOUNTS. Add the following to § 11.1 INSURANCE

The limits of liability for the insurance required by Paragraph 11.1 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations.

Insurance requirements apply as follows:

The limits of liability for the insurance required by Section 11.1 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

- A. Workers’ Compensation: As in accordance with AS 23.30.045:
 - 1. State: Statutory
 - 2. Employer's Liability:
 - Bodily Injury by Accident: \$100,000.00 Each Accident
 - Bodily Injury by Disease: \$100,000.00 Each Employee
 - Bodily Injury by Disease: \$500,000.00 Policy Limit
- B. Commercial General Liability (Primary Limits):
 - 1. a. General Policy
 - \$1,000,000.00 Each Occurrence
 - \$2,000,000.00 Annual Aggregate
 - b. Products/Completed Operations
 - \$1,000,000.00 Each Occurrence
 - \$2,000,000.00 Annual Aggregate
 - c. Personal Injury
 - \$1,000,000.00 Each Occurrence
 - 2. Excess Commercial Liability
 - \$5,000,000.00 in excess of Primary Limits
- C. Comprehensive Automobile Liability: including Owned, Hired, and Non-Owned Vehicles:
 - 1. Combined Single Limit, Bodily Injury and Property Damage \$1,000,000.00
- D. Builder's Risk insurance, as described in Paragraph 11.1.3.1 of 00 7000 - General Conditions, is not required for this project.

SGC 3: PERFORMANCE BOND AND PAYMENT BOND AMOUNTS. Add the following to § 11.2 PERFORMANCE BOND AND PAYMENT BOND

§11.2.4 PERFORMANCE AND PAYMENT BOND AMOUNTS.

.1 The Contractor shall furnish, when required, Performance and Payment Bonds on forms provided by the CBJ for the penal sums of 100% of the amount of the Bid award. The surety on each bond may be any corporation or partnership authorized to do business in the State of Alaska as an insurer under AS 21.09. These bonds shall remain in effect for 12 months after the date of final payment and until all obligations and liens under this contract have been satisfied. The Contractor shall also furnish such other Bonds as are required by the Supplementary General Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable

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Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

.2 If the surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Work is located, the Contractor shall within 7 days thereafter substitute another Bond and Surety, which must be acceptable to the Owner.

.3 All Bonds required by the Contract Documents to be purchased and maintained by Contractor shall be obtained from surety companies that are duly licensed or authorized in the State of Alaska to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions. The City Engineer may, on behalf of the Owner, notify the surety of any potential default or liability.

END OF SECTION

SUMMARY OF WORK– 01 1000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section. Construction Safety and Phasing Plan (CSPP) attached to these documents.

1.2 SUMMARY

- A. Section Includes:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Access to site.
 - 4. Coordination with occupants.
 - 5. Work restrictions.
 - 6. Specification and drawing conventions.
 - 7. Miscellaneous provisions.
- B. Related Requirements:
 - 1. Section 01 5000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: JNU Runway Safety Area Improvements, Phase 2B.
 - 1. Project Location: Juneau International Airport, 1873 Shell Simmons Drive, Juneau, AK 99801
 - 2. Owner's Representative: to be designated by Patricia K. Wahto, Airport Manager
- B. Design Engineer: DOWL, 4041 B Street, Anchorage Alaska, 99503
- C. Design Engineer's sub-consultants: In addition to the Design Engineer the following design professionals have prepared designated portions of the Contract Documents:
 - 1. Morris Engineering Group, LLC, 2375 Jordan Ave. #7, Juneau, AK, 88901
 - 2. Murray & Associates, P.C., PO Box 21081, 99802

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of project is defined by the Contract Documents and generally consists of the following:
 - 1. Bid Schedule 1 Northwest Development Area Aircraft Parking Apron consists of drainage improvements; utility installation and relocations; geothermal loop piping and well field; aircraft tie-downs; hot mix asphalt pavement; taxiway edge lights and reflective markers; pavement marking; placement of recycled asphalt pavement; and perimeter fence.
 - 2. All other Bid Schedules depicted in the project drawings dated July 15, 2016 are NOT INCLUDED in the contract documents.
- B. Type of Contract:
 - 1. Bid Schedule 1 will be constructed under a single prime contract.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on drawings by the contract limits and as indicated by requirements of this section.
- B. Use of Site: Limit use of Project site to areas indicated. Do not disturb portions of project site beyond areas in which the Work is indicated.
 - 1. Limits of the Site: Limit use of the site for staging, storage, handling of debris and construction materials, deliveries, etc. to the areas indicated on the drawings.
 - 2. Parking: Employee private vehicles are to be parked in specified areas only.

SUMMARY OF WORK– 01 1000

3. Driveways, Gates, and Building Entrances: Keep driveways, gates and entrances serving premises clear and available to Owner's employees, Airport users, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations. The Airport Manager and staff will not accept or coordinate deliveries of any kind.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - C. Security: Maintain airport security requirements (Section 01 5200) throughout the Work.
- 1.6 COORDINATION WITH OCCUPANTS
- A. Full Owner Occupancy: Owner will occupy or utilize areas of the airport around the project site throughout the construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations.
 1. Maintain access to existing roadways, walkways and other adjacent occupied or used facilities. Do not close or obstruct walkways or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner in advance of activities that will affect Owner's operations as required in the CSPP.
- 1.7 WORK RESTRICTIONS
- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
 2. Work on site shall not commence until Owner has provided written approval of the Contractor's Construction Security Plan.
 3. Work on site shall not commence until Owner has provided written approval of the Safety Plan Compliance Document (SPCD) in accordance with the CSPP and FAA AC 150/5370-2F.
 - B. On-Site Work Hours:
 1. There are no limits to work hours except those to comply with applicable noise ordinances of the City and Borough of Juneau.
 2. Coordinate all required work by FAA and airport management staff during normal working hours Monday through Friday. Each crew has a different work schedule.
 - C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than five days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
 - D. No Smoking and Controlled Substances: Use of tobacco products and other controlled substances within the project area is not permitted.
 - E. Employee Identification: Provide identification tags for Contractor personnel working in secure areas of Project site. Require such personnel to use identification tags at all times. See Section 01 5200, Security for additional requirements.
 - F. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working in secure areas of project site.

SUMMARY OF WORK– 01 1000

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

- B. Division 01 Requirements: Requirements of Sections in Division 01 apply to the Work of all sections in the specifications.

- C. Drawing Coordination: Requirements for materials and products identified on drawings are described in detail in the specifications. One or more of the following are used on drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

SUBSTITUTION PROCEDURES – 01 2500

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 6000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three hard copies of each request for consideration. If electronic requests are allowed, one electronic submission directed to parties identified by the Owner shall be provided. Identify product, fabrication, or installation method to be replaced. Include Specification Section number and title and drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided by the Owner.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for project.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall contract time. If specified product or method of construction cannot be provided within the contract time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the contract sum.

PROJECT MANAGEMENT AND COORDINATION – 01 3100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 1. General coordination procedures.
 2. Coordination drawings.
 3. RFIs.
 4. Project meetings.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner or Contractor seeking information required by, or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Prior to the Pre-Construction conference, or within ten days of receipt of contract award (whichever occurs first), submit a list of key personnel assignments, including superintendent and other personnel in attendance at project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to project.
 1. Post copies of list in project meeting room, in temporary field office and in prominent location in built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different sections of the specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different sections that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.

PROJECT MANAGEMENT AND COORDINATION – 01 3100

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual sections, and additionally where installation is not completely indicated on shop drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors for concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. Indicate dimensions shown on drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Owner indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 3. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 4. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 5. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 6. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit and emergency lights, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 7. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

PROJECT MANAGEMENT AND COORDINATION – 01 3100

8. Review: Owner will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.
9. Owner will furnish Contractor one set of digital data files of drawings for use in preparing coordination digital data files.
 - a. Architect/Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to drawings.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified by the Owner.
 1. Owner will return without response those RFIs submitted to Architect/Engineer by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's Work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation including the specification section, drawing number and detail references, and field dimensions and conditions, as appropriate. Provide Contractor's suggested resolution.
- C. Owner's Action: Owner and Architect/Engineer (as needed) will review each RFI, determine action required, and respond. Allow seven working days for Owner's response for each RFI.
 1. Owner's action may include a request for additional information, in which case the time for response will date from time of receipt by Owner of additional information.
 2. Action on RFIs that may result in a change to the contract time or the contract sum may be eligible for Contractor to submit a cost/time proposal.
- D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number and submit to Owner periodically or as requested by Owner.
- E. On receipt of Owner's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Owner within seven days if Contractor disagrees with response.

1.8 PROJECT MEETINGS

- A. General: Attend and participate in project meetings and conferences at project site unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
 2. Agenda: Owner will prepare and distribute the meeting agenda. Contractor may request agenda items to the Owner.
 3. Minutes: Owner record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned within three days of receipt the meeting minutes.
- B. Preconstruction Conference: Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Contractor, but no later than 15 days after execution of the Agreement.
 1. Attendees: Authorized representatives of Owner, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Security.
 - b. Responsibilities and personnel assignments.
 - c. Tentative construction schedule.

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- d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for RFIs.
 - i. Procedures for testing and inspecting.
 - j. Procedures for processing Applications for Payment.
 - k. Distribution of the Contract Documents.
 - l. Submittal procedures.
 - m. Preparation of Record Documents.
 - n. Use of the premises.
 - o. Work restrictions and working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Progress cleaning.
3. Minutes: Owner will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at project site before each construction activity when required by other sections and when required for coordination with other construction.
- 1. Attendees: Owner, Architect/Engineer, Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Related RFIs.
 - c. Related Change Orders.
 - d. Deliveries.
 - e. Submittals.
 - f. Review of mockups.
 - g. Possible conflicts.
 - h. Compatibility requirements.
 - i. Time schedules.
 - j. Weather limitations.
 - k. Manufacturer's written instructions.
 - l. Warranty requirements.
 - m. Compatibility of materials.
 - n. Acceptability of substrates.
 - o. Temporary facilities and controls.
 - p. Space and access limitations.
 - q. Regulations of authorities having jurisdiction.
 - r. Testing and inspecting requirements.
 - s. Installation procedures.
 - t. Coordination with other work.
 - u. Required performance results.
 - v. Protection of adjacent work.
 - w. Protection of construction and personnel.

PROJECT MANAGEMENT AND COORDINATION – 01 3100

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than seven days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect/Engineer and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspections leading up to Substantial Completion and final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for final payment.
 - i. Responsibility for removing temporary facilities and controls.
 4. Minutes: Owner will record and distribute meeting minutes.
- E. Progress Meetings: Owner will conduct progress meetings at regular intervals.
1. Attendees: In addition to representatives of Owner, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the contract time.
 - 1) Review schedule for activities expected to be accomplished during the coming two week period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Coordination and interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access and site use.
 - 7) Progress cleaning.

PROJECT MANAGEMENT AND COORDINATION – 01 3100

- 8) Quality and work standards.
 - 9) Status of correction of deficient items.
 - 10) Field observations.
 - 11) Status of RFIs.
 - 12) Status of Proposal Requests.
 - 13) Status of Change Orders.
 - 14) Pending claims and disputes.
3. Minutes: Owner will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 3100

CONSTRUCTION PROGRESS DOCUMENTATION – 01 3200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Start-up construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction reports.
- B. Related Sections:
 - 1. General Conditions and Supplementary General Conditions of the Contract.
 - 2. Division 1 and technical specification sections, as applicable.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.
- F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit schedules in electronic format using Microsoft Project or other software approved by the Owner.
- B. Start-up construction schedule.
 - 1. Approval of cost-loaded start-up construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Start-up Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

CONSTRUCTION PROGRESS DOCUMENTATION – 01 3200

- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - E. Construction Reports: Submit at monthly intervals using Microsoft Word for narrative and Microsoft Project for schedules, or other format approved by the Owner.
 - F. Special Reports: Submit at time of unusual event in format approved by the Owner.
- 1.5 COORDINATION
- A. Coordinate Contractor's construction schedule with the schedule of values, subcontracts, submittal schedule, progress reports, payment requests, and other schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved; monitor and maintain commitments throughout the Work.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from Notice to Proceed to the date of final completion.
- B. Activities: Treat each phase or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Owner.
 - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 30 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to shop drawing development, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times.
 - 4. Startup and Testing Time: Include not less than 5 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in at least 5 days in advance of date established for Substantial Completion, and allow time for Owner's administrative procedures necessary for certification of Substantial Completion.
 - 6. Punch List and Final Completion: Include not more than 30 days for punch list and final completion (combined).
- C. Milestones: Include milestones indicated in the contract documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completions, and Final Completion.
- D. Upcoming Work Summary: Prepare a weekly summary report, indicating activities scheduled to occur for at least 2 weeks ahead of Work. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered RFIs.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
- E. Recovery Schedule: When periodic update indicates the Work is 5 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and indicate date by which recovery will be accomplished.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a preliminary Gantt-Chart Schedule at the Preconstruction conference, and a subsequent comprehensive, fully developed, horizontal Gantt-chart-type,

CONSTRUCTION PROGRESS DOCUMENTATION – 01 3200

Contractor's construction schedule within 7 days of the Notice to Proceed that includes materials or components that require more than 30 days from order to be received on site.

2.3 REPORTS

- A. Monthly Construction Reports: Prepare a monthly construction report recording the following information concerning events at project site:
1. List of subcontractors at project site.
 2. Approximate count of personnel at project site, recorded daily.
 3. Equipment at project site.
 4. Material deliveries.
 5. Accidents and emergency procedures initiated.
 6. Meetings and significant decisions.
 7. Unusual events such as stoppages, delays, shortages, and losses.
 8. Orders and requests of authorities having jurisdiction.
 9. Request for Proposals accepted and implemented.
 10. Construction Change Directives received and implemented.
 11. Services connected and disconnected.
 12. Equipment or system tests and startups.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals in conjunction with Request for Payment, or at other times as requested by the Owner, update schedule to reflect actual construction progress and activities.
1. Revise schedule immediately after each progress meeting or other activity where revisions have been recognized or made.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect/Engineer, Owner, sub-contractors, and other parties identified by Contractor with schedule responsibility.
1. Post copies in Project meeting room.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 3200

SUBMITTAL PROCEDURES – 01 3300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections, apply to this Section.
- B. Submittal requirements may be included in technical specification sections.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting shop drawings, product data, samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action. Action submittals are those submittals indicated in individual specification sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual specification sections as "informational submittals."
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - 4. Submit revised submittal schedule to reflect submittal status and timing.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Digital Data Files: Owner will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing shop drawings.
 - 1. Architect/Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each specification section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same specification section as separate packages under separate transmittals.

SUBMITTAL PROCEDURES – 01 3300

4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.

- D. Electronic Submittals: Identify and incorporate the following information in each electronic submittal file:
 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/Engineer.
 4. Transmittal Form for Electronic Submittals: Use form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date of submission.
 - c. Name of Contractor.
 - d. Names of subcontractor, manufacturer, and supplier.
 - e. Submittal purpose and description.
 - f. Specification section number and title.
 - g. Drawing number and detail references, as appropriate.
 - h. Location(s) where product is to be installed, as appropriate.
 - i. Related physical samples submitted directly.
 - j. Indication of full or partial submittal.
 - k. Transmittal number.
 - l. Other necessary identification.

- E. Options: Identify options requiring selection by Owner.

- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect/Engineer's action stamp.

SUBMITTAL PROCEDURES – 01 3300

- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on project site. Use only final action submittals that are marked with approval notation from Architect/Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual specification sections. Types of submittals are indicated in individual specification sections.
 - 1. Submit electronic submittals via email as PDF electronic files.
 - a. Owner will return annotated file. Annotate and retain one copy of file as an electronic project record document file.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as shop drawings, not as product data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's product specifications.
 - b. Color charts.
 - c. Statement of compliance with specified referenced standards.
 - d. Testing by recognized testing agency, with labels and seals noted.
 - e. Notation of coordination requirements.
 - f. Availability and delivery time information.
 - 4. Submit Product Data before or concurrent with samples.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect/Engineer's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit shop drawings on sheets at least 8.5x11.
 - 3. Submit shop drawings in PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of samples that includes the following:
 - a. Generic description of sample.
 - b. Product name and name of manufacturer.
 - c. Number and title of applicable specification section.
 - d. Specification paragraph number and generic name of each item.

SUBMITTAL PROCEDURES – 01 3300

- E. Application for Payment and Schedule of Values: Comply with requirements specified in the General Conditions and other Division 1 sections.
- F. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures."

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01770 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include project name and location, submittal number, specification section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 OWNER'S ACTION

- A. Action Submittals: Owner will review each submittal, make marks to indicate corrections or revisions required, and return it. Owner may forward submittal to Architect/Engineer who will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- C. Submittals not required by the Contract Documents may be returned by the Owner without action.

END OF SECTION 01 3300

QUALITY REQUIREMENTS – 01 4000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.
- B. Technical specifications for specific test and inspection requirements.
- C. GCP 100 and 110

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the contract document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the sections that specify those activities. Requirements in those sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the contract document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Owner or authorities having jurisdiction are not limited by provisions of this section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by the Owner.
- C. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee or subcontractor to perform a particular construction operation, including installation, erection, application, and similar operations.

QUALITY REQUIREMENTS – 01 4000

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
 - I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- 1.4 CONFLICTING REQUIREMENTS
 - A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Owner for a decision before proceeding.
 - B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. Refer uncertainties to Owner for a decision before proceeding.
- 1.5 INFORMATIONAL SUBMITTALS
 - A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
 - B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.
 - C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the applicable systems or components.
 - D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications acceptable to the Owner.
- 1.6 CONTRACTOR'S QUALITY-CONTROL PLAN
 - A. Quality-Control Plan, General: The Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.
 - B. Submit quality-control plan in a form acceptable to the Owner within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule. The Contractor shall discuss and present, at the preconstruction conference, its understanding of the quality control requirements.
 - C. In accordance with FAA General Provisions, paving projects over \$500,000 in value shall have a Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Contractor, subcontractors, testing laboratories, and Owner's representative at start of construction. The workshop shall address QC and QA requirements of the project specifications. The Contractor shall coordinate with the Owner and the Engineer on time and location of the QC/QA workshop.

QUALITY REQUIREMENTS – 01 4000

- D. Quality-Control Program Administrator: The Contractor shall appoint a Quality Control Program Administrator who shall have a minimum of five (5) years of experience in airport construction and shall have had prior quality control experience on a project of comparable size and scope as the contract. 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 documents and technical specifications. The Program Administrator shall report directly to a responsible officer of the construction firm.
 - E. 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 registered engineers, registered architects, engineering/construction management technicians, or experienced craftsman with qualifications in the appropriate trade and field or work, and shall have a minimum of two years of experience in their area of expertise as quality control technicians. The quality control technicians shall report directly to the Program Administrator.
 - F. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and as indicated by the Owner.
 - 3. Owner-performed tests and inspections indicated in the contract documents.
 - G. Continuous Inspection of Work quality: Describe process for continuous inspection during construction to identify and correct deficiencies in work quality in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of quality established by contract requirements.
 - H. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Owner has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.
- 1.7 REPORTS AND DOCUMENTS
- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections in a format acceptable to the Owner. Include the following:
 - 1. Date of issue.
 - 2. Name, email address, and telephone number of testing agency and/or persons making tests and inspections.
 - 3. Dates and locations of samples and tests or inspections.
 - 4. Description of the Work and test and inspection method.
 - 5. Identification of product and specification section.
 - 6. Complete test or inspection data, results, and interpretation thereof.
 - 7. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 8. Name and signature of laboratory inspector.
 - 9. Recommendations on retesting and re-inspecting.
 - B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other sections in a format acceptable to the Owner. Include the following:
 - 1. Name, address, email, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at project site comply with requirements.

QUALITY REQUIREMENTS – 01 4000

4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual specification sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections in a format acceptable to the Owner. Include the following:
1. Name, address, email, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual specification sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual specification sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project for at least five years and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project for at least five years and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project for at least five years and whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who possesses at least five years' experience in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated for a period of at least five years prior to the project.
- G. Manufacturer's Technical Representative and Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products and has at least five years' experience in projects similar in material, design, and extent to those indicated for this project.

QUALITY REQUIREMENTS – 01 4000

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency or inspector to perform these services.
1. Owner will furnish Contractor with names, addresses, email, and telephone numbers of testing agencies or inspectors engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the contract documents, or that the Contractor requested to proceed on a partial basis to accommodate construction sequencing will be charged to Contractor, and the contract sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the contract documents are Contractor's responsibility.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections, and submittal written reports.
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

1.10 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as described in the contract documents, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Owner and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a written report of each test, inspection, and similar quality-control service to Owner with copy to Contractor and to authorities having jurisdiction, when applicable.
 4. Submitting a final report of special tests and inspections at Substantial Completion that includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the contract documents.
 6. Retesting and reinspecting corrected work.

QUALITY REQUIREMENTS – 01 4000

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FREQUENCY

- A. Contractor shall implement the Quality Control Program throughout the Work. Inspections shall be performed daily to ensure continuing compliance with contract requirements until completion of the particular feature of work.
- B. During field operations, quality control test results and periodic inspections shall be used to ensure the quality of all materials and work quality. All equipment used in placing, finishing, assembling, 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.

3.2 TEST AND INSPECTION LOG

- A. Prepare a record of tests and daily inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Owner.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Owner's reference during normal working hours.

3.3 DOCUMENTATION

- A. Daily Inspection Reports. Each of the Contractor's quality control technicians shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. 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
 - 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 Owner shall be provided at least one copy of each daily inspection report on the work day following the day of record.

3.4 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes in accordance with the contract document requirements for cutting and patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 4000

TEMPORARY FACILITIES AND CONTROLS – 01 5000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 5200 "Security"

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the contract sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Owner's construction forces, Architect/Engineer, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for Contractor's connection of temporary service. Provide connections and extensions of services as required for construction operations and in compliance with the authorities having jurisdiction. The Contractor's water connection shall include a water meter.

Electric Power: Contractor shall provide temporary electrical service for use on the project. Provide connections of service as required for construction operations and in compliance with the authorities having jurisdiction.

- C. Toilets: Contractor shall provide clean and functional temporary toilet facilities that shall be regularly maintained for use of Contractor's personnel throughout the project.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion and Sedimentation-Control Plan: Show compliance with requirements of JNU Airport's multi-sector permit for storm water discharge for Work that affects existing surface drainage.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

1.5 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits, except that Owner will obtain and pay for the necessary building permit.
- B. Accessible Temporary Egress: Comply with applicable codes and airport regulations to maintain access to building and vehicular routes around the building.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its

TEMPORARY FACILITIES AND CONTROLS – 01 5000

use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Office: Contractor shall establish a mobile field office in the designated project staging and storage area on airport property, or in another location agreed to by the Owner.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters or open-flame heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Obtain written approval of temporary facility locations by the Owner and locate where they will serve project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Promptly remove facilities when they are no longer needed.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary services or connect to existing services.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. At Substantial Completion, remove or restore all temporary facilities to condition existing before initial use.
- B. Electric Power Service: Connect temporary services in accordance with applicable code and utility company regulations.
- C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - 2. Maintain conservation practices to shut off lighting when work is not underway

3.3 SUPPORT FACILITIES INSTALLATION

- A. Temporary Use of Permanent Roads and Paved Areas: Contractor may utilize existing roads and paved areas, within construction limits indicated, as necessary for construction operations and in accordance with Airport safety and security regulations.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
 - 3. Maintain established vehicular and aircraft traffic routes in and around the Work area.

TEMPORARY FACILITIES AND CONTROLS – 01 5000

- C. Parking: Use designated parking areas for construction personnel.
 - D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding project or adjoining properties or endanger permanent Work or temporary facilities.
 - 2. Juneau International Airport holds a multi-sector permit issued by the Alaska Department of Environmental Conservation for storm water discharge. Contractor shall comply with all applicable permit conditions through completion of the Work.
 - E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Airport safety requirements regarding Flying Object Debris (FOD).
- 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION
- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - C. Security Enclosure: Install temporary enclosure (barricades) around partially completed areas of construction.
 - D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
 - E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures.
- 3.5 MOISTURE AND MOLD CONTROL
- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished Work. Document visible signs of mold that may appear during construction.
 - B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Remove standing water from roof deck.
 - 4. Keep roof deck openings covered or dammed.

TEMPORARY FACILITIES AND CONTROLS – 01 5000

- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Discard or replace water-damaged material.
 - 2. Do not install material that is wet.
 - 3. Discard, replace, or clean stored or installed material that begins to grow mold.
- 3.6 OPERATION, TERMINATION, AND REMOVAL
 - A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
 - B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period.

END OF SECTION 01 5000

SECURITY AND SAFETY – 01 5200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SECURITY PROGRAM AT JUNEAU INTERNATIONAL AIRPORT

- A. The Contractor shall:
 1. Protect Work area and existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
 2. Prepare a Safety Plan Compliance Document in compliance with FAA Advisory Circular 150/5370-2.
 3. Initiate security program, approved by Owner, prior to start of Work, including coordination of all temporary fencing, gates, and controls to meet Transportation Security Administration (TSA) and JNU Airport Security requirements.
 4. Maintain program throughout construction period until Owner's occupancy.
 5. All security changes necessary for construction activities to the perimeter gates, doors, and/or fence must be requested 60 days in advance. Temporary changes may be requested within 72 hours.
 6. Vehicles, equipment, and stockpiled material may not be parked or staged within 6 feet of the perimeter fence, gate, and/or door.

1.3 ACCESS CONTROL

- A. The Contractor shall:
 1. Provide a secure Work area in accordance with the drawings and other provisions relating to Airport Security.
 2. Restrict entry of persons and vehicles into the project site and the airport restricted area (airport property inside the fence).
 3. Allow entry only to authorized persons with proper identification.
 4. Construct all temporary fencing, gates and controls in accordance with applicable security requirements.
 5. Utilize Gate E in accordance with JNU Airport security to access the Work site.
- B. Owner shall control entrance of persons and vehicles related to Owner's operations.
- C. The Contractor shall be liable for any fines levied against the Airport by the TSA resulting from actions of the Contractor, or those for whom the Contractor is responsible, that cause a breach of security in the area of construction, to include any points of entry into the Air Operations Area (AOA), also known as the restricted area of the Airport, utilized for the construction project. Failure to maintain security will also include failure to abide by the Airport badge identification program or other requirements pertaining to the security of the Airport.

1.4 AIR OPERATIONS AREA (AOA) BADGE REQUIREMENTS

- A. Only Juneau International Airport Identification Badge, Law Enforcement Credentials, Federal Inspector Credentials and Airline Crew Credentials are recognized as authority to enter or be present in the restricted area of the airport without escort. Only persons identified by this system are permitted access.
- B. Any person found in a location that is not the work area or access route to and from the work area will be removed from the area and action will be taken against violators as appropriate.
- C. Security Identification Display Area (SIDA) badges are required for the Work. Contractor shall apply for clearance with Juneau International Airport Badging Office. Requirements for each employee include completing an Identification Badge/Media Application, photo proof of identity, either proof of US citizenship or work authorization paperwork, and completion of a Federal Security Threat Assessment.
 - Contractor shall assume a minimum of two weeks for the clearance process, however, the clearance process is conducted by TSA and delays may exceed two weeks.

SECURITY AND SAFETY – 01 5200

- D. Contractor's personnel are subject to random checks for compliance with badging and permit regulations. Such checks may be conducted by Airport Police, Airport Employees, and/or TSA.
 - E. Any falsifications can result in revocation of the badges for the individual in question, and any fines incurred from the violations will be passed to the responsible party.
 - F. The Airport Badge Application is an agreement between the Airport and the badge holder. The badge application provides all rules and procedures the badge holder must comply with while in the restricted area of the airport.
 - G. In order to maintain accountability for all Airport Identification Badges issued, the Contractor is responsible for physically collecting and returning to the Airport all outstanding badges no longer used for the construction project including those badges carried by persons no longer working on the project. Proof of return is the Airport Receipt issued by the Airport.
 - H. When someone terminates employment, the Contractor shall immediately notify the Airport so that the badge can be deactivated. If termination is outside of the normal working hours, the Contractor shall immediately notify Airport Police at 586-0899 or 321-3802 of the termination.
 - I. A non-refundable fine of \$300.00 will be levied against the Contractor for each badge not returned within five (5) days of badge expiration, employee termination or completion of the project, whichever is sooner.
 - J. Should an employee lose his or her Airport Identification Badge, he or she shall immediately notify the Contractor, who shall then immediately notify the Airport to deactivate the badge access. If lost after normal business hours, the lost badge shall be reported to Airport Police. If the lost badge is found the Contractor must notify the Airport to reactivate the badge. Further, the Airport will confirm the employee's employment status prior to reactivation of a badge reported lost, then found by its owner. If requested, a replacement badge will not be issued until a replacement request letter is received and the \$200.00 lost badge fee is paid. This is a separate fee from the non-refundable fine of \$300.00 applied to non-returned badges. If a replacement badge is issued for a lost badge, and the \$200.00 fee paid, the Contractor will not be charged the non-refundable fine of \$300.00.
 - K. Final payment to the Contractor will not be authorized until all badges are returned to the Airport.
 - L. The Contractor's and subcontractor's personnel shall be badged for this project as needed to complete the Work. Upon request of the Contractor, Escort Authority may be authorized by the Owner to specific employees or subcontractors of the Contractor when the Work is limited in duration. In such cases, the Contractor is fully responsible for all such personnel.
- 1.5 VEHICLE ACCESS IN THE AOA
- A. The TSA requires the Airport Operator to control access into and prevent unauthorized vehicles from entering the AOA. In compliance with this requirement, the Airport Operator has established procedures to authorize or deny access to the AOA and to identify and control vehicles while within the AOA.
 - B. When any vehicle, other than one that has prior approval from the airport operator, must travel over any portion of an area used by aircraft moving under its own power, as well as the 135-AOA ramp, it will be properly identified and an amber colored rotating beacon is required.
 - C. All Contractor vehicles requiring access to the AOA shall display a company name/logo. Company name/logo must be affixed to both sides of the vehicle (vehicle magnets are not prohibited in the AOA).

SECURITY AND SAFETY – 01 5200

- D. Contractor vehicles are only authorized in the areas where their contract work is being performed and on the access routes to and from that area; during contract working hours (unless otherwise required for emergencies).
- E. A Contractor vehicle is authorized in the AOA only when within its area of authorization, the safety flag are properly displayed, and all occupants have the required Airport Identification Badge.

1.6 PROJECT SITE SECURITY

- A. All access points into the project area must be kept secure. Temporary barriers shall be required and described in the Contractor's approved Safety Plan Compliance Document. The Contractor shall notify the Owner at least 72 hours before the following conditions:
 - B. When construction is to begin.
 - C. When Work is complete.

1.7 SAFETY PLAN

- A. Contractor shall submit a written Safety Plan Compliance Document developed in accordance with FAA Advisory Circular 150/5370-2 for work in the AOA. The plan shall address the following:
 1. Maintaining safe airport operations in the vicinity of the Work, including separating pedestrian, vehicles, equipment, and aircraft.
 2. Maintaining clean and safe construction operations including controlling Foreign Object Debris (FOD).
 3. Controlling access to the Work area through the use of temporary fencing and barricades and restricting access by unauthorized persons.
 4. Understanding the safety problems and hazards described in AC 150/5370-2, Operational Safety on Airports During Construction.
 5. Conducting activities so as not to violate any safety standards contained in AC 150/5370-2 or any of the references therein.
 6. Promptly taking all actions necessary to prevent or remedy any unsafe or potentially unsafe conditions as soon as they are discovered.
 7. Identifying locations for stockpiled materials, equipment operations, access to haul routes, and construction site parking.
 8. Marking the area of Work as a hazardous area on the aircraft ramp area with barricades, traffic cones, flags, or flashers. These markings restrict access and make hazards obvious to aircraft, personnel, and vehicles. During periods of low visibility and at night, identify hazardous areas with red flashing or steady-burning light.
 9. The Contractor must ensure that all trash, debris, and bird attractants are stored in proper areas. Further, all vehicles/equipment are clean of bird attractants.
- B. Contractor's overall project safety plan shall be reviewed and updated at Progress Meetings and at other times as required by the Owner's Representative.

1.8 RESTRICTIONS

- A. The Contractor shall not allow cameras on site or photographs to be taken by persons under the control of the Contractor except by written approval of the Owner.
- B. Contractor shall, at all times, give way to all aircraft and follow directions from aircraft ground crews.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 5200

PRODUCT REQUIREMENTS – 01 6000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 2500 "Substitution Procedures" for requests for substitutions.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced.
 - 1. Include data to indicate compliance with the contract documents requirements.
 - 2. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Owner will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Use form of Approval: As specified in Section 01 330 "Submittal Procedures."
 - b. Use product specified if Owner does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 330 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on project, select product compatible with products previously selected, even if previously selected products were also options.

PRODUCT REQUIREMENTS – 01 6000

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize storage at project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration or theft.
 - 3. Deliver products to project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.
 - 7. Provide a secure location and enclosure at project site for storage of materials and equipment. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other sections shall be in addition to, and run concurrent with, other warranties required by the contract documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations of the contract documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 7700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete roofing system installation and indicated use and effect.

PRODUCT REQUIREMENTS – 01 6000

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Owner will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Products:
 - a. Restricted List: Where specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
2. Manufacturers:
 - a. Restricted List: Where specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Owner will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Owner may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the contract documents, is consistent with the contract documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

EXECUTION – 01 7300

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections apply to this section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation of the Work.
- B. Related Requirements:
 - 1. Section 01 1000 "Summary of Work" for limits on use of Project site.
 - 2. Section 01 3300 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 7700 "Closeout Procedures" for submitting final documents, recording of Owner-accepted deviations during construction, and final cleaning.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Owner of locations and details of cutting and await directions from Owner before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or in increased maintenance or decreased operational life or safety.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety
 - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

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1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION AND LAYOUT

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with installer or applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to the Owner according to requirements in Section 01 3100 "Project Management and Coordination."
- D. Surface and Substrate Preparation: Comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

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- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of project that might be exposed during cutting and patching operations.
- D. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- E. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as

EXECUTION – 01 7300

practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

END OF SECTION 01 7300

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL – 01 7419

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Foreign Object Debris (FOD): A substance, debris or article alien to aircraft that would potentially cause damage to aircraft or flight control mechanisms. FOD includes, but is not limited to, loose hardware, tools, pavement fragments, trash, building materials, rocks, pens, coins, hats, soda cans, paper clips, rags, and wildlife.
- E. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- F. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- G. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Provide handling, containers, storage, signage, transportation, and other items as required to handle waste during the entire duration of the contract.
 - 1. Comply with operation, termination, and removal requirements in Section 01 5000 "Temporary Facilities and Controls."
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on project site necessary for waste management.
 - 2. Comply with Section 01 5000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.
- C. Comply with Airport safety requirements regarding Foreign Object Debris (FOD). Release of uncontrolled debris or materials of any kind is prohibited any place on or over airport property.
- D. Demolition debris is to be collected and containerized.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL – 01 7419

- E. Contractor to inspect the entire work area, including the grounds immediately around the building on a daily basis and ensure that FOD is not being released. If FOD is found, notify Owner and collect FOD immediately, identify the origin of the material found and describe modifications to work process or procedures necessary to prevent additional FOD release.

3.2 DISPOSAL OF WASTE

- A. General: Remove waste materials from project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.
- D. Containers: All debris is to be collected, stored and transported in an enclosed container.

END OF SECTION 01 7419

CLOSEOUT PROCEDURES – 01 7700

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 7300 "Execution" for progress cleaning of Project site.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release from authorities having jurisdiction.
- B. Certificate of Insurance for continuing coverage.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 00 and 01 sections, including project record documents, operation and maintenance manuals, final completion construction photos, damage or settlement surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, bonds, maintenance service agreements, final certifications, and similar documents.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Complete final cleaning requirements, including touchup painting.
 - 3. Repair and restore marred exposed finishes to eliminate visual defects.
 - 4. Complete Owner training.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 5 days prior to date the work will be completed and ready inspection. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner's Representative will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect/Engineer that must be completed or corrected before certificate will be issued.

CLOSEOUT PROCEDURES – 01 7700

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according the General Conditions.
 2. Certified List of Incomplete Items: Submit certified copy of Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect/Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Other forms and certificates required by the Contract Documents.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Utilize professional cleaning service with personnel qualified and experienced in cleaning building components and systems used in the project. Clean each surface or unit to condition expected for new commercial building standard.
1. Remove labels that are not permanent
 2. Wipe surfaces of mechanical and electrical equipment.
 3. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 4. Clean light fixtures, lamps, and reflectors to function with full efficiency.
- C. Clean project site, yard, and grounds, in all areas disturbed by construction activities.

CLOSEOUT PROCEDURES – 01 7700

- D. Sweep paved and concrete slab areas broom clean. Remove spills, stains, and other foreign deposits.
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
 - B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - 2. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 01 7700

OPERATION AND MAINTENANCE DATA – 01 7823

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 1. Operation manuals for systems and equipment.
 2. Product maintenance manuals.
 3. Systems and equipment maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 1. Where applicable, clarify and update reviewed manual content to correspond to modifications, field conditions, and record drawings and specifications.
- B. Format: Submit operations and maintenance manuals in the following formats:
 1. PDF electronic file. Assemble into a single composite manual with electronically-indexed file. Submit on digital media acceptable to the Owner.
 - a. Name each indexed document file in composite electronic index with applicable item name.
 - b. Enable inserted reviewer comments on draft submittals.
 2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Owner will return one copy.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 7 days before commencing demonstration and training. Prior to demonstration and testing, Owner will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 7 days before commencing demonstration and training. Owner will return copy with comments.
 1. Correct or modify each manual to comply with Owner's comments and submit corrected manuals prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual by discipline (architectural, structural, mechanical, and electrical) and into a separate section for each system or piece of equipment not part of a system. Each manual shall contain the following materials:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Date of submittal.
 4. Name and contact information for applicable Contractor and subcontractors.
 5. Names and contact information for Architect and consultants to the Architect that designed the systems contained in the manuals.
 6. Cross-reference to related systems in other operation and maintenance manuals.

OPERATION AND MAINTENANCE DATA – 01 7823

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to specification section number.
 - D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system and equipment.
 - E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. Enable bookmarking of individual documents based upon file names and configure electronic manual to display bookmark panel upon opening file.
 - F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, 3-ring, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 - 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
- 2.2 OPERATION MANUALS
- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System and equipment descriptions.
 - 2. Performance and design criteria if Contractor is delegated design responsibility.
 - 3. Operating standards and procedures.
 - 4. Operating logs.
 - 5. Wiring and control diagrams.
 - 6. Piped system diagrams.
 - 7. Precautions against improper use.
 - 8. License requirements including inspection and renewal dates.
 - B. Descriptions: Include the following:
 - 1. Product name and model number as indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function and operating characteristics.
 - 5. Performance curves and limiting conditions.
 - 6. Engineering data and tests.
 - 7. Complete nomenclature and number of replacement parts.

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- C. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping including normal shutdown instructions.
 - 6. Seasonal operating instructions.
 - 7. Required sequences for electric or electronic systems.
 - 8. Special operating instructions and procedures.
 - D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
 - E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
- 2.3 PRODUCT MAINTENANCE MANUALS
- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
 - B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - C. Product Information: Include the following, as applicable:
 - 1. Product name, model number, color, and similar identifying information.
 - 2. Manufacturer's name.
 - 3. Material and chemical composition.
 - D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
 - E. Repair Materials and Sources: Include lists of materials and sources of materials.
 - F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.
- 2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS
- A. Content: For each system and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
 - B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

OPERATION AND MAINTENANCE DATA – 01 7823

- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and sources of maintenance materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the contract documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Division 1 Section "Project Record Documents."

OPERATION AND MAINTENANCE DATA – 01 7823

- E. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 7823

PROJECT RECORD DOCUMENTS – 01 7839

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

Section includes administrative and procedural requirements for project record documents, including the following:

- 1. Record Drawings.
- 2. Record Specifications.
- 3. Record Product Data.

- B. Related Sections:

- 1. Division 01 Sections as applicable.
- 2. Technical Specifications for specific requirements for project record documents of the Work in those Sections

1.3 SUBMITTALS

- A. Record Documents: Maintain one paper copy set of marked-up record prints and specifications for interim and final submittals.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Maintain one set of marked-up paper copies of the contract drawings including shop drawings at a location on-site approved by the Owner.
 - 1. Neatly mark record prints in red font to show the actual installation where installation varies from that shown originally.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in neat, straight lines acceptable to the Owner.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to drawings.
 - b. Revisions to details shown on drawings.
 - c. Depths of foundations.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Duct size and routing.
 - h. Locations of concealed internal utilities.
 - i. Changes made through Request for Proposal or Construction Change Directive.
 - j. Changes made following Request for Information or Owner's written directive.
 - k. Details not on the original contract drawings.
 - 3. Mark the contract drawings and shop drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up prints.
 - 4. Mark record sets with red-colored ink or pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original drawings.
 - 6. Note Construction Change Directive numbers, Request for Proposal numbers, and similar identification, where applicable.

PROJECT RECORD DOCUMENTS – 01 7839

2.2 RECORD SPECIFICATIONS

- A. Mark specifications to indicate the actual product installation where installation varies from that indicated in Specifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record product data has been submitted in operation and maintenance manuals.
 - 5. Note related Change Orders and record drawings where applicable.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Store record documents at a location approved by the Owner and apart from the contract documents used for construction. Do not use record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Provide access to project record documents for Owner's reference during normal working hours. Owner may require updated record documents as a condition of authorizing progress payments.

END OF SECTION 01 7839

PART II

TECHNICAL SPECIFICATIONS

(In Alphabetical Order)

ITEM D-701 STORM DRAINS AND CULVERTS

DESCRIPTION

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

MATERIALS

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

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

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

Corrugated Polyethylene Drainage Tubing	AASHTO M 252
Corrugated Polyethylene Pipe, 300 mm to 1200 mm Diameter	AASHTO M 294
Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter	AASHTO M 304

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

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

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

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

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

701-2.8 CULVERT MARKER POSTS. Provide posts made of durable glass fiber and resin reinforced material flexible to -40°F, resistant to impact and ultraviolet light. "T" in cross section, 3.75 inch wide x 72 inches long, and color blue. Provide Carsonite CUM-375 utility marker or approved equal.

701-2.9 CLASS B BEDDING. Use one of the following materials:

- a. Suitable material as defined in specification subsection P-152-2.3, except that 100% of the material will pass a 1 inch sieve. P-208 Aggregate Surface Course (when included in this contract). P-209 Crushed Aggregate Base Course (when included in this contract).

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

CONSTRUCTION METHODS

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

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 12 inches or 1/2 inch for each foot of fill over the top of the pipe (whichever is greater) but for no more than 75% of the nominal diameter of the pipe. The width of the excavation shall be at least 1 foot greater than the horizontal outside diameter of the pipe. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches in uncompacted depth to form a uniform but yielding foundation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

100% of the material placed within 1 foot of the pipe will pass a 3 inch sieve.

If the pipe is placed in or under the structural section, construct the backfill according to the material and construction requirements of the specifications for the applicable lift of material (P-154, P-208, P-209).

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

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

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

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

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

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

701-3.7 END SECTIONS. End Section installation shall conform to the CBJ Standard Drawing D-06.01 Culvert End Sections.

METHOD OF MEASUREMENT

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

701-4.2 CONCRETE. The volume of concrete for pipe cradles will not be measured for pavement

701-4.3 ROCK. The volume of rock will not be measured for payment.

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

701-4.5 END SECTIONS. End sections will not be measured for payment.

701-4.6 EXCAVATION AND BACKFILL. The excavation and backfill for storm drains and culverts will not be measured for payment.

BASIS OF PAYMENT

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

All excavation and backfill required to complete storm drain and culvert installation shall be included in the unit price for the pipe involved.

Payment for Aluminum Plate Culvert with Baffles will be made at the contract unit price for work acceptably completed. All work associated with the construction of the plate culvert and baffles, including but not limited to; labor, equipment, tools, hauling, transportation, and incidentals will be included in the contract price for Aluminum Plate Culvert with Baffles.

Payment will be made under:

- Item D-701a(1) Corrugated Polyethylene Pipe, 12 inch - per linear foot
- Item D-701a(2) Corrugated Polyethylene Pipe, 18 inch - per linear foot
- Item D-701a(3) Corrugated Polyethylene Pipe, 24 inch – per linear foot
- Item D-701a(4) Corrugated Metal Pipe, 18 inch – per linear foot

MATERIAL REQUIREMENTS

AASHTO M 36	Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
AASHTO M 45	Aggregate for Masonry Mortar
AASHTO M 85	Portland Cement
AASHTO M 157	Ready-Mixed Concrete
AASHTO M 190	Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 196	Corrugated Aluminum Alloy Culverts and Underdrains
AASHTO M 198	Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
AASHTO M 219	Aluminum Alloy Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 243	Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 252	Corrugated Polyethylene Drainage Tubing
AASHTO M 294	Corrugated Polyethylene Pipe, 300 to 1200 mm Diameter

AASHTO M 304	Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO M 324	Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM A760	Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A761	Steel Galvanized, Corrugated Structural Plates and Fasteners for Pipe, Pipe-Arches, and Arches
ASTM A762	Precoated (Polymeric) Galvanized Steel Sewer and Drainage Pipe
ASTM A849	Post-Coated and Lined (Bituminous or Concrete) Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Corrugated Aluminum Alloy Culvert Pipe
ASTM C14	Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C1433	Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers, 3 – 24 in
ASTM C76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C506	Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C655	Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C700	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM D1056	Flexible Cellular Materials--Sponge or Expanded Rubber
ASTM D3034	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Corrugated Polyethylene Pipe and Fittings
ASTM F714	Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Poly (Vinyl Chloride) Ribbed Drain Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Polyethylene (PE) Large Diameter profile Wall Sewer and Drain Pipe
ASTM F949	Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
ASTM F2435	Steel Reinforced Polyethylene (PE) Corrugated Pipe

ASTM F2562	Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

ITEM D-751 MANHOLES, CATCH BASINS, INLETS, AND INSPECTION HOLES

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, cast in place manholes, catch basins, inlets, vaults, and inspection holes, according to these Specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the Plans or required by the Engineer.

MATERIALS

751-2.1 BRICK. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 MORTAR. Mortar shall consist of one part by volume portland cement and two parts sand. The portland cement shall conform to the requirements of AASHTO M 85, Type I. The sand shall conform to the requirements of AASHTO M 45.

751-2.3 CONCRETE. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 PRECAST CONCRETE PIPE MANHOLE RINGS. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches nor more than 48 inches. There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole.

751-2.5 CORRUGATED METAL. Corrugated metal shall conform to the requirements of AASHTO M 36.

751-2.6 FRAMES, COVERS, AND GRATES. The castings shall conform to one of the following requirements:

- a. Gray iron castings shall meet the requirements of ASTM A48, Class 30B and 35B.
- b. Malleable iron castings shall meet the requirements of ASTM A47.
- c. Steel castings shall meet the requirements of AASHTO M 103.
- d. Structural steel for grates and frames shall conform to the requirements of ASTM A283, Grade D.
- e. Ductile iron castings shall conform to the requirements of ASTM A536.
- f. Austempered ductile iron castings shall conform to the requirements of ASTM A897.

All castings or structural steel units shall conform to the dimensions shown on the Plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of AASHTO M 111.

751-2.7 STEPS. The steps or ladder bars shall be gray or malleable cast iron, injection-molded polypropylene, or galvanized steel. The steps shall be the size, length, and shape shown on the Plans and those steps that are not galvanized shall be given a coat of bituminous paint, when directed.

CONSTRUCTION METHODS

751-3.1 UNCLASSIFIED EXCAVATION.

- a. **Limits of Excavation.** The Contractor shall excavate for structures and structure footings to the lines and grades or elevations, shown on the Plans, or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximately only; and the Engineer may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.
- b. **Excavation.** Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the Engineer. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed, and excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.
- c. **Shoring.** The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.
- d. **Shoring Removal.** All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not damage or disturb finished masonry. The cost of removal shall be included in the unit price bid for the structure.
- e. **Engineer's Approval.** After excavation is completed for each structure, the Contractor shall notify the Engineer. No concrete or reinforcing steel shall be placed after the Engineer has approved the depth of the excavation and the character of the foundation material.

751-3.3 CONCRETE STRUCTURES. Concrete structures shall be built on prepared foundations. The contractor shall confirm the dimensions and shape prior to removing the existing structure. The construction shall conform to the requirements specified in Item P-610. Reinforcement is required and shall be depicted on shop drawings prepared by the contractor. Shop drawings shall be approved by the Engineer before the concrete is placed.

All invert channels shall be constructed and shaped accurately so as to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 PRECAST CONCRETE STRUCTURES. Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the Plans. All precast concrete pipe sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joint between precast concrete risers and tops shall be full-bedded in cement mortar. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal steps which are embedded or built into the side walls shall be aligned and placed at vertical intervals of 12 inches. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 CORRUGATED METAL STRUCTURES. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in

place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 INLET AND OUTLET PIPES. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes so as to form a tight, neat connection.

751-3.7 PLACEMENT AND TREATMENT OF CASTINGS, FRAMES, AND FITTINGS. All castings, frames, and fittings shall be placed in the positions indicated on the Plans or as directed by the Engineer, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface in order so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the Plans or as directed by the Engineer. All units shall set firm and secure.

After the frames or fittings have been set in final position the concrete or mortar shall be allowed to harden for 7 days, before the grates or covers are placed and fastened down.

751-3.8 INSTALLATION OF STEPS. The steps shall be installed as indicated on the Plans or as directed by the Engineer. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least 7 days. After 7 days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete pipe structures, they shall be cast into the sides of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches.

Instead of steps, prefabricated ladders may be installed. For of brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the Engineer.

751-3.9 BACKFILLING. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the Plans or as directed by the Engineer.

Backfilling shall not be placed against any structure until approved by the Engineer. For concrete structures, approval shall not be given until the concrete has been in place 7 days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill placing methods.

751-3.10 VAULT MANHOLES. Vault manholes shall be constructed as shown on the plans.

METHOD OF MEASUREMENT

751-4.1 Manholes, will be measured by the unit. Manhole covers and frames will not be measured for payment and are subsidiary to the work.

751-4.2 Cast in place manholes will not be measured for payment. The Engineer's acceptance constitutes measurement.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes will be paid for at the contract unit price per each or contract lump sum price complete and in place. This price shall be full compensation for furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the Plans.

Cast in place Manhole, payment will be made at the contract lump sum price or the unit price for the item installed and accepted in place. The price includes full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

All excavation and backfill required to complete the items of this section shall not be measured for payment, and shall be considered as a subsidiary obligation of the Contractor, included in the contract unit price for the structure involved.

Adjustments to existing sewer cleanouts affected by construction shall be considered as a subsidiary obligation of the Contractor.

Payment will be made under:

- Item D-751a(1) Manhole, Type I – per each
- Item D-751a(2) Manhole, Type II - per each
- Item D-751ab Cast in Place Manhole – lump sum
- Item D-751e Adjust Existing Manhole – per each

MATERIAL REQUIREMENTS

AASHTO M 36	Zinc Coated (Galvanized) Corrugated Iron or Steel Culverts and Underdrains
AASHTO M 45	Aggregate for Masonry Mortar
AASHTO M 85	Portland Cement
AASHTO M 103	Steel Castings, Carbon, for General Application
AASHTO M 111	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A47	Malleable Iron Castings
ASTM A48	Gray Iron Castings
ASTM A283	Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes, and Bars
ASTM A536	Ductile Iron Castings
ASTM A897	Austempered Ductile Iron Castings

ASTM C32	Sewer and Manhole Brick
ASTM C478	Precast Reinforced Concrete Manhole Sections
ASTM C1433	Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers

ITEM D-754 CONCRETE GUTTERS, DITCHES, AND FLUMES

DESCRIPTION

754-1.1 This item shall consist of portland cement concrete curb, gutters, or a combination of curb and gutter, ditches, and flumes constructed according to these Specifications at the specified locations according to the dimensions, lines, and grades as shown on the Plans.

MATERIALS

754-2.1 CONCRETE. Plain and reinforced concrete shall meet the requirements of Item P-610.

754-2.2 JOINTS. Joint filler materials and premolded joint material shall conform to Item P-610.

CONSTRUCTION METHODS

754-3.1 PREPARING SUBGRADE. Excavation shall be made to the required width and depth, and the subgrade upon which the item is to be built shall be compacted to a firm uniform grade. All soft and unsuitable material shall be removed and replaced with suitable approved material. When required, a layer of approved granular material, compacted to the thickness indicated on the Plans, shall be placed to form a subbase. The underlying course shall be checked and accepted by the Engineer before placing and spreading operations are started.

754-3.2 PLACING. If approved, construct the curb using a curb forming or slip-form machine

The forms and the mixing, placing, finishing, and curing of concrete shall conform to the requirements of Item P-610 and the following requirements.

The concrete shall be tamped until it is consolidated and mortar covers the top surface. The surface of the concrete shall be floated smooth and the edges rounded to the radii shown on the Plans. Before the concrete is given the final finishing, the surface shall be tested with a 12-foot straightedge, and any irregularities of more than 1/4 inch in 12 feet shall be eliminated.

The concrete shall be placed with dummy-grooved joints not to exceed 25 feet apart, and no section shall be less than 4 feet long.

Expansion joints shall be constructed to replace a dummy groove at spacings of approximately 100 feet. When a gutter abuts a pavement or other structure, an expansion joint shall be placed between the gutter and the other structure.

Forms shall not be removed within 24 hours after the concrete has been placed. Minor defects shall be repaired with mortar containing 1 part cement and 2 parts fine aggregate.

Depositing, compacting, and finishing the item shall be conducted to build a satisfactory structure. If any section of concrete is found to be porous, or is otherwise defective, it shall be removed and replaced by the Contractor without additional compensation.

754-3.3 BACKFILLING. After the concrete has set sufficiently, the spaces adjacent to the structure shall be refilled to the required elevation with material specified on the Plans and compacted by mechanical equipment to at least 95% of the maximum density as determined by ATM 207 or ATM 212. The in-place density and moisture content shall be determined according to ATM 213.

METHOD OF MEASUREMENT

754-4.1 The accepted length of curb and gutter, measured along the front face of the curb and gutter at the finished grade elevation. No deduction in length will be made for drainage structures or ramps installed in the curb.

BASIS OF PAYMENT

754-5.1 Payment will be made at the contract unit price per linear foot.

Payment will be made under:

Item D-754a Curb and Gutter - per linear foot

TESTING REQUIREMENTS

ATM 212 Standard Density of Coarse Granular Materials Using the Vibratory Compactor

ATM 207 Moisture-Density Relations of Soils

ATM 213 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods

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 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. The cantilever sliding gate system shall be manufactured by Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY or approved equal. The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions.

- a. The top member shall be a 3" x 5" aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf. To maintain structural integrity this frame member shall be "keyed" to interlock with the "keyed" track member. If fabricated as a single horizontal piece, the bottom member shall be a 2" x 5" (51mm x 127mm) aluminum structural tube weighing not less than 2.0 lb/lf. If fabricated in two horizontal pieces, the bottom member shall be a 5" aluminum structural channel weighing not less than 2.6 lb/lf. When the gate frame is manufactured in two horizontal pieces or sections, they shall be spliced in the field (the gate frame shall be fabricated in one or multiple sections depending on size requirements or project constraints).
- b. The vertical members at the ends of the gate frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2" x 2" (51mm x 51mm) and weighing not less than 1.6 lb/lf. Major 2" x 2" vertical members weighing not less than 1.1 lb/lf shall separate each bay and shall be spaced at less than gate height intervals. Intermediate 1" x 2" vertical members weighing not less than .82 lb/lf shall alternate between 2" x 2" major members.
- c. The gate frame shall have a separate semi-enclosed "keyed" track, extruded from 6005A-T61 or 6105-T5 aluminum alloy, weighing not less than 2.9 lb/lf. The track member is to be located on only one side of the top primary. Welds to be placed alternately along the top and side of the track at 9" centers with welds being a minimum of 2" (51mm).
- d. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.02 D.
- e. The gate frame is to be supported from the track by two (2) swivel type, self-aligning, 4-wheeled, sealed lubricant, ball-bearing truck assemblies. The bottom of each support post shall have a bracket equipped with a pair of 3" UHMW guide wheels. Wheel cover protectors shall be included with bottom guides to comply with UL325. Gap protectors shall be provided and installed, compliant with ASTM F 2200-05.

- f. Diagonal "X" bracing of 3/16" or 1/4" diameter stainless or galvanized steel cable shall be installed throughout the entire gate frame.
- g. Chain Link: 2" x 2" x 9 gauge aluminized steel chain link fabric shall extend the entire length of the gate (if operated gate, counterbalance must also have fabric to prevent reach through and comply with ASTM F2200, see 1.03 C.1) Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each 2" x 2" vertical member with standard fence industry ties. ASTM F2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).

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.

The Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet or such length that the stock can be kept in the proper field. The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence.

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. The Contractor shall comply with FAA-STD-019, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment, Paragraph 4.2.3.8, Lightning Protection for Fences and Gates, when fencing is adjacent to FAA facilities.

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-foot Chain-Link Fence - per linear foot
Item F-162d	24-foot Single Cantilever Gate - per each
Item F-162p	Temporary Fence – per linear foot

MATERIAL REQUIREMENTS

AASHTO M 181	Chain-Link Fence
AASHTO M 280	Metallic-Coated (Carbon) Steel Barbed Wire
ASTM A121	Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
ASTM A123	Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A392	Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A491	Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A572	High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A653	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A824	Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link Fence
ASTM A1011	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low Alloy with Improved Formability, and Ultra High Strength
ASTM B117	Operating Salt Spray (Fog) Apparatus
ASTM B221	Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
ASTM B429	Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM F668	Polyvinyl Chloride(PVC), Polyolefin and other Organic Polymer Coated Steel Chain-Link Fence Fabric
ASTM F1043	Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083	Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F1183	Aluminum Alloy Chain Link Fence Fabric
ASTM F1345	Zinc 5% Aluminum-Mischmetal Alloy Coated Steel Chain-Link Fence Fabric
ASTM G152	Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G153	Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G154	Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
ASTM G155	Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials
FAA-STD-019	Lighting and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment

ITEM F-170 STEEL BOLLARD

DESCRIPTION

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

MATERIALS

170-2.1 Use materials that conform to the following:

- a. **Steel Pipe.** Use standard weight, Grade B, galvanized, welded, or seamless pipe meeting ASTM A53.
- b. **Concrete.** Use commercial grade concrete with a minimum 28-day compressive strength of 2,500 psi or an approved, pre-mixed, sacked concrete.
- c. **Paint.** Use single component, moisture cure, polyurethane (SC-MC-U) zinc primer. Use single component, moisture cure, aliphatic polyurethane (SC-MC-ALIP-U) safety yellow paint for the top coats.
- d. **Retroreflective Bands.** Use flexible high intensity sheeting, pressure sensitive type, cut to form 6-inch wide reflector bands meeting 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 No measurement of quantities will be made.

BASIS OF PAYMENT

170-5.1 Payment will be subsidiary to F-162d, U-100a.

ITEM F-171 POWER GATE OPERATORS

DESCRIPTION

171-1.1 Provide a complete and operational power gate operating system, with controls, designed and manufactured to operate as an integral system with the cantilever gate as located and shown on the plans.

MATERIALS

171-2.1 APPROVALS. Obtain approval of all materials or equipment proposed to use or incorporate in the work. Submit to the Engineer five (5) complete listings of materials and equipment specified herein and on the plans. Prepare the list to clearly identify the material or equipment by item, name, or designation used and indicate where specified. Provide submittals neatly bound, clearly indexed, and include applicable catalog numbers, cuts, wiring diagrams, performance data, operation and maintenance manuals, etc., for all material or equipment specified. In addition, whenever 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.

171-2.2 COMPONENTS. Provide major components to include a new load center, gate operator, radio control and keypad system, cable, conduit, circuit breakers, and connectors. Provide NEMA approved electrical components. Provide testing of the gate operators and control systems before shipment from the factory.

- a. **Gate Operator.** 1 horsepower minimum, 240 volts, single phase, capable of instant reversing, and adjustable time delay relay from 1/2 to 180 seconds for closing, UL 325 listed, mechanical braking within NEMA 3R enclosure. Chamberlain Group, Inc. Model SL595 Heavy Duty, Harsh Environment, or approved equal.
- b. **Key-Pad System.** Provide complete keypad systems designed to be impervious to the local environmental conditions. Install at each automated gate. Include any required power supplies and interfaces for a self-contained remote unit capable of handling at least two keypads.

Provide for each gate, 2 each keypads and terminal or interface to be controlled by either the radio or keypad systems. Digital Key Model 1050 Industrial Access or approved equal.

Include time delay relays, adjustable from 1/2 to 180 seconds for each system.

- c. **Radio-Control System.** Provide complete radio-control system. Include any required power supplies and interfaces for self-contained remote units.

Provide radio-receiver system designed to be impervious to local environmental conditions.

Provide system that interfaces with the keypad system and designed to be controlled by either method.

Provide for each gate operator, 12 each adjustable frequency transmitters, Pulsar Control or approved equal.

- d. **Load Center.** Provide enclosure for housing equipment, NEMA 12 lockable type, including an interior panel. Minimum size 36" x 24" x 10. Hoffman or approved equal. Provide enclosure sized large enough to house panel, radio, keypad interface, power supply, and relays. Size distribution center to accommodate the equipment indicated in the load center wiring diagram on the plans.

Provide panel board rated as shown on the plans, single phase, 3- wire, and sized to provide all circuits and spares indicated. Provide branch breakers of bolt in type. Install panel board in the enclosure.

- e. **Conductors for secondary systems in conduits.** Provide copper, 600 volt Type XHHW, black (phase conductors) and white or yellow (neutral).
- f. **Rigid steel conduit.** Provide standard weight (schedule 40) steel pipe, galvanized on the outside and finished with 40 mil PVC exterior coating and with interior finished with a coating of urethane, Robroy Industries or approved equal. Provide fittings that meet the same specifications as the conduit.
- g. **Flexible metal conduit.** Provide liquid tight Anaconda Type 'EF' or approved equal.
- h. **Marker tape.** Provide yellow polyethylene plastic, printed "Caution Buried Electric Line Below", Allen System or approved equal.
- i. **Tapes.**
 - (1) Pipe Sealing Tape: Scotch No. 48, Teflon pipe sealing tape or approved equal.
 - (2) Corrosion Preventive Tape: Scotch No. 43 or approved equal.
 - (3) Electrical Insulating Tape: Scotch No. 88 or approved equal.
- j. **Ground conductor.** Provide stranded bare copper, #6 AWG.
- k. **Ground rods.** Provide 3/4" x 10' copper clad steel.
- l. **Concrete.** Provide commercial grade concrete with a minimum 28-day compressive strength of 2,500 psi or an approved, pre-mixed, sacked concrete.
- m. **Trench Backfill.** Use material of the type shown on the plans.

CONSTRUCTION REQUIREMENTS

171-3.1 GENERAL. Install gate operator and control systems as shown on the plans and in accordance with the manufacturer's instructions. Perform work in conformance with the NEC, the National Fire Protection Association, and all State and local codes. Locate new gate operators, fixtures, conduit, cables, etc., as shown on the plans and/or as directed by the Engineer.

171-3.2 TRENCHING, EXCAVATION, AND BACKFILLING. Trenches or excavations may be excavated manually or with mechanical equipment of standard manufacture specifically designed for excavating or trenching. Do not use blades of road patrols or graders to excavate the trenches.

Ensure that excavations for the placement or construction of items associated with the electrical work are of sufficient size to permit the placement or construction of the full width, length, and depth of the structure or object and the layer of bedding material, whenever bedding is required. Such items include, but are not limited to, foundations, footings, slabs, pads, manholes, handholes, ducts and/or duct banks, light base assemblies or outing stakes. Use the specified backfill material as shown on the plans.

Excavate the walls of trenches as near vertical as practical with smooth bottom, and free of frost susceptible material, pools of water, trash or debris. Control drainage in the vicinity of the trenches to prevent the runoff of surface water in the trenches. Promptly pump to remove any water accumulated in the trenches.

Provide trenches for burial of cable or conduit of sufficient width to provide a minimum 3 inches of lateral clearance between the conduit and trench walls on both sides or provide the lateral clearance as shown on the plans. Provide sufficient depth so that the top of the cable or conduit is a minimum of 18 inches below finish grade or to the depth indicated on the plans, when installed; and graded to slope as required.

Before placing any conduit in the trenches, remove all rocks or stones larger than 2 inches in diameter from the bottom of the trench. Tamp the trench bottom by filling or cutting away as required, to provide uniform conduit grades, sloping towards outlets, as shown on the plans. Call for inspection of the trenches by the Engineer before placing conduit.

Backfilling. Before backfilling, cover the conduit with a 3 to 6 inch layer of approved backfill or bedding material as shown on the plans. Begin backfilling of the trenches after the conduit is installed and inspected and approved for backfilling by the Engineer. Thoroughly tamp the initial cover layer. Backfill the remainder of the trench with approved materials as shown on the plans, placed in 6-inch layers. Compact each layer to the density of the adjacent undisturbed ground and/or to the satisfaction of the Engineer. Backfill completely to the level of the adjacent surface. For trenches and excavations in areas where a surface layer of gravel, rock, or other material differing from subgrade has previously been placed, fill the upper part of the trench with the same material salvaged from the excavating or scripted from the adjoining surface. Provide at least 6 inches of surfacing material in the trench. For trenches in existing asphalt concrete, resurface the trench with a minimum 3-inch depth of an approved, pre-mixed, sacked concrete.

Restore all surface areas disturbed and/or damaged by trenching, excavation, sorting of materials, or any other construction related activities to their original condition except as stated above. Replace surfacing or cover material with new material of the same type of material removed. Accomplish restoration and/or removal and replacement of surfacing as required under this item at no additional cost to the State.

171-3.3 GROUNDING. Install grounding electrodes and grounding conductors as shown on the plans.

171-3.4 TESTING. Furnish all necessary labor, materials, equipment, appliances and power for conducting and performing tests of materials, equipment and/or systems. Begin tests after the work has been inspected and approved by the Engineer. Tabulate, sign, and date all test results on reproducible test sheets. No work will be accepted until all the applicable tests are performed successfully with satisfactory results and test sheets delivered to the Engineer.

Repair and/or remove and replace materials, equipment and/or systems that do not test satisfactorily. Retest after repair or replacement.

Test and demonstrate to the Engineer the following:

- a. Circuits are properly connected in accordance with applicable wiring diagrams.
- b. Power and control circuits are continuous and free from short circuits.
- c. Circuits are free from unspecified grounds.
- d. Resistance to ground of all ungrounded 600 volt multiple circuit conductors is not less than ten megohms when tested with a 1,000 volt megger.
- e. Circuits are operable. Demonstration to include operation of each control and switch 10 times.

171-3.5 INSPECTION. Notify the Engineer and request inspection at least 48 hours prior to installing cables, conduit, concrete or lighting fixtures, making any splices, or covering any buried or concealed work. Immediately correct any deficiencies found during the inspection.

171-3.6 RECORD DOCUMENTS. Maintain at the project site a complete set of contract plans, Specifications, and approved changes to the contract documents. In addition to the above, maintain a separate complete set of electrical drawings for as-built purposes. Note all changes upon these as-builts along with the date and authority approving the change.

On the as-built drawings, show locations of all items such as lights, conduit, handholes, etc., including any existing active lines encountered. Show dimensions from roadway and taxiway centerlines or other permanent objects. Include complete wiring diagrams, (both power and control), identifying terminals, cables, and connections.

171-3.7 GUARANTEE. Guarantee that all materials or workmanship found defective within one year of final acceptance will be replaced at the your expense, promptly upon notification and to the satisfaction of the Owner.

METHOD OF MEASUREMENT

171-4.1 Measured as a complete unit to include radio and keypad system, gate operator, poles, load center with panel, relays, all wire and conduit, grounding rods, ground conductors, concrete footings, excavation, bedding, backfill, marker tape, concrete bases, all testing and all other incidentals necessary for an approved and operational power gate operator system installation.

BASIS OF PAYMENT

171-5.1 Payment for power gate operator system will be made under pay item F-162d.

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

100-4.1 Payment for mobilization and demobilization will be made in partial payments as follows:

- a. When equipment and supplies are landed in serviceable condition at the project site and other necessary preparation have been completed so that work can commence on other pay items, 60% of the pay item.
- b. When 25% or more of the original contract is earned, an additional 20%.
- c. With Final Payment, the remaining 20%.

The Owner 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

100-5.1 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(1) Mobilization and Demobilization - per lump sum
- Item G-100a(2) Mobilization and Demobilization - per lump sum
- Item G-100a(3) Mobilization and Demobilization - per lump sum
- Item G-100a(4) Mobilization and Demobilization - per lump sum
- Item G-100a(5) Mobilization and Demobilization - 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 " CITY AND BOROUGH OF JUNEAU". 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.

ITEM 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, 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 Owner. No payment will be made separately or directly for embankments.

Payment will be made under:

- Item G-150a(1) Equipment Rental - per hour
- Item G-150a(2) Equipment Rental - per hour
- Item G-150a(3) Equipment Rental - per hour
- Item G-150a(4) Equipment Rental - per hour
- Item G-150a(5) Equipment Rental - per hour

ITEM G-300 CRITICAL PATH METHOD 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 Owner. 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 Owner.

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(1) CPM Scheduling - per lump sum
- Item G-300a(2) CPM Scheduling - per lump sum
- Item G-300a(3) CPM Scheduling - per lump sum
- Item G-300a(4) CPM Scheduling - per lump sum
- Item G-300a(5) 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. The airport flagger shall have no other assigned duties.

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 and as listed below:

1. Common Traffic Advisory Frequency (CTAF) – 118.7 MHz
2. Tower – 278.3, 118.7 MHz. Between May and September, an additional Tower Frequency of 120.7 MHz will be in use. Its use will be announced via the ATIS on 135.3 MHz.
3. Ground Control – 121.9 MHz

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 \$57.00 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(1) Airport Flagger - per contingent sum
- Item G-700a(2) Airport Flagger - per contingent sum
- Item G-700a(3) Airport Flagger - per contingent sum
- Item G-700a(4) Airport Flagger - per contingent sum
- Item G-700a(5) Airport Flagger - per contingent sum

ITEM G-705 WATERING FOR DUST CONTROL

DESCRIPTION

705-1.1 Furnish all equipment and labor necessary to supply watering for dust control as required by the approved traffic control plans or as directed by the Engineer. This item is for dust control outside of the construction work area. Dust control within the work area is incidental to the contract and no separate payment will be made.

REQUIREMENTS

705-2.1 WATERING. Furnish, haul, and place water for dust control as directed. Use water trucks capable of adjusting the rate of water flow from the operators position. Distribute a light-water spray pumped from a tanker in a uniform spray pattern to cover a minimum 30 foot width in one pass and without causing erosion. Gravity flow will not be allowed. 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 (DNR). Comply with the Alaska Department of Fish and Game and/or DNR Office of Habitat Management and Permitting screening requirements for all water removal operations.

METHOD OF MEASUREMENT

705-3.1 By the 1,000 gallons (M-gallon) of water applied. The water will be measured by means of calibrated tanks or distributors, accurate water meters, or by weighing. 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.

BASIS OF PAYMENT

705-4.1 The contract price includes all resources required to provide watering, as directed.

Payment will be made under:

Item G-705a Watering for Dust Control – per M-gal

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. Remove the existing taxiway lights and replace them with new as shown. Remove the existing lighted signs and replace them with new lighted signs as shown. Provide all other work shown on the drawings that is covered under the bid items for this specification.

Perform all work necessary to the above systems to make them fully functional and operational at the completion of the work performed under this section.

Remove all unused or replaced portions of the above systems as shown on the drawings.

Furnish all labor, equipment, supplies and materials and perform all operations necessary to complete the work described in this section and work shown on the plans which is covered under this section of the specifications. All work shall comply with the applicable FAA advisory circulars, the National Electrical Code (NEC), National Electrical Safety Code (NESC), and any applicable National Fire Protection Association (NFPA) codes.

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. The submittal information for any item may not be submitted separately from the bound submittals. All materials for all electrical items (L-100, 108, 110, & 112) shall be submitted in the same bound submittal set for L-100, 108, 110, & 112. If there are more pages than one binder can hold, the submittal shall be split into volumes of more than one binder. If any submittal material in any volume is rejected, all of the volumes have to be resubmitted as one group. Re-submittals and individual submittals shall not be provided as separate sheets, but shall be included in the bound submittals.

- 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) **Taxiway Edge Light, Medium Intensity, L861T**, with LED 6.6 A lamp, heater and Lexan lens, with 1" support column, 2" metal frangible coupling with stainless steel hex head set screws, and upper plug and cord assembly with separable connector. 5345-46
- (2) **Airport Signs, L-858**, internally lighted. with legend size, style, and class as indicated on the plans. 5345-44

(3) Airport Light Base, L-867, transformer housing, Class I, hot dipped-galvanized steel Size B, 24 inches deep, one piece with internal grounding lug, gasket, steel cover, base extension, drain opening, and conduit. . Provide 6” drain hole offset so edge of hole is one inch from side wall of base, gasket, Hot dipped-galvanized steel cover, and conduit holes with grommets as indicated on the plans and as required. The drain hole shall be drilled by the manufacturer prior to hot dip galvanizing the light base. 5345-42

(4) 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. Provide a 30/45 watt transformer with taxiway edge lights and a 200 watt transformer with runway edge or threshold lights. Provide transformers for airport signs as required by sign per manufacturer’s recommendations. 5345-47

(5) Primary Handhole, L-868, class 1, size B, hot dipped-galvanized steel, 24 inches deep x 12 inches diameter, conduit holes with grommets as shown on the plans and as required, 1-3/8 inch N.P.T. conduit hubs (with number and location of hubs as indicated, 6 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

b. Sealer. Adhesive sealant shall be a self-leveling silicone sealer.

c. 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. All electrical equipment not covered by FAA equipment specifications shall be UL listed where standards have been developed by that company

d. Lock Washers. Lock washers shall be two piece cam-type lock washer.

e. 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.

f. Soft Gasket. Gaskets to be installed between the base plate and base in watertight lighting systems shall be soft neoprene.

g. 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.

h. 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.

i. Concrete. Conform to Item P-610 Structural Portland Cement Concrete, 1-inch maximum size coarse aggregate.

j. Hot Mix Asphalt (HMA). Conform to Item P-401.

k. Washed Rock. Use aggregates that meet the requirements of P-610-2.2, except meet AASHTO M 43, Number 67, for ¾” minus.

l. Crushed Aggregate Base Course. Use material that meets the requirements P-209, and gradation D-1.

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.

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.

All equipment shall be installed per the manufacturer's recommendations, per the applicable FAA advisory circulars, per these specifications and as shown on the drawings.

All joints between metal and concrete shall be sealed with a sealant meeting Federal Specification TT-S-001543A – Sealing Compound, Silicone Rubber Base – Class A, Non-Sag. Product shall be DOW Corning 888 Silicone Highway Joint Sealant with 35888 Primer on metal, painted, or epoxy painted surfaces, or approved equal.

Clean all construction debris from all light bases, hand holes, and all other equipment.

Washed rock shall be mechanically compacted in lifts no greater than 8 inches in thickness, to the satisfaction of the Engineer.

Crushed aggregate base course shall be placed and compacted to 100% as specified in P-209.

100-3.2 INSTALLATION OF NON-WATERTIGHT EDGE LIGHTS. The light base shall be placed on a layer of bedding material as shown on the plans the Contractor shall construct the backfill according to the specifications for the material in which the conduit is placed. The material shall be compacted to the requirements of the material into which it is placed. The light base shall be placed so the light cover plate bolts are 1/4" below finished grade. When lights are installed in a sloped section of runway the highest edge of fixture shall be 1/4" below finished grade. The base shall be level to within $\pm 1/16$ " inch.

Connect the insulating 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, ty wrap transformer to light base lid. Provide adequate primary and secondary cable slack in each light base to assure that all connectors can be lifted at least 12 inches above the top 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.

The light base shall be connected to the grounding system as shown on the drawings. The edge lights shall be located where shown on the plans. A laser or survey equipment shall be used to position the lights per the tolerances specified.

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 Owner, promptly upon notification and to the satisfaction of the Engineer.

100-3.8 SPARE PARTS. Provide a quantity of spare light fixtures and transformers equal to 10 percent (rounded down) of the installed quantity of each type fixture and size of transformer, but not less than one of each type or size. Deliver spare parts to airport maintenance as directed by the Engineer.

100-3.9 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 in accordance with applicable wiring diagrams.
- e. That all circuits are operable.

100-3.10 INSTALLATION OF LIGHTED AIRPORT SIGNS. All signs shall be powered from a dedicated isolation transformer located in a light base set in the concrete base for the sign. The transformer shall be fed from the nearest taxiway or runway light base as shown on the drawings. All signs shall have frangible couplings on the bases.

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.
- c. **Contingent Sum.** For spare parts, the quantity shall be equal to 10 percent (rounded down) of the installed quantity of each type of fixture and size of transformer, but not less than one of each size or type. The total cost of spare parts for each airport aid shall not exceed \$10,000, per FAA regulations. If necessary, reduce the quantity of each spare part equally until the costs are at or below the \$10,000 limit.

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 unless otherwise noted. Cutting and patching of asphalt as required for equipment removal or installation shall be considered subsidiary to the pay items below.

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.

Refer to Item P-401 for requirements regarding all work and materials to place Hot Mix Asphalt. Hot Mix Asphalt is subsidiary to L-100 items requiring its use.

Subsidiary work – All work associated with providing the equipment and materials included in this section of the specifications that is not specifically covered in the pay items below shall be considered subsidiary to the pay items below and shall not be paid for separate from the pay items below. This includes any work required to access the area in and across soft ground or muskeg necessary to perform work under this and related items.

All work required during the construction staging and sequencing of this project including disconnecting and reconnecting equipment, temporary power, temporary wiring, temporary lighting, and all other work needed to keep the FAA equipment and the runway and taxiway lighting systems operational during the construction period when the airport is open for operations is considered subsidiary to the pay items below and shall not be paid for separate from the pay items below.

Item L-100e, Taxiway Edge Light, L-861T: Complete, including L-867 base assembly, gasket, cover, frangible coupling, support column, L-830-1 45 watt isolating transformer, L-823 cable connectors, grounding lug and connector, conduit grommets, trenching, bedding, backfilling, compaction, cutting and removal of existing asphalt pavement if present and re-paving if required, and all necessary incidentals to provide a complete and operable/acceptable taxiway light installation.

Item L-100g, Primary Handhole, L-868, Size B: Includes traffic rated steel cover and gasket, grounding lug and connector. Includes conduit grommets, grounding, trenching, bedding, backfilling, compaction, cutting and removal of existing asphalt pavement if present and re-paving if required, and all necessary incidentals to provide an installed handhole.

Item L-100h, Remove airport electrical: Removal of all electrical in project area as shown on drawings. Includes complete removal of all hand holes, runway or taxiway edge or centerline light bases, isolation transformers, and light assemblies including connection to conduit and/or cable. Backfill of light base location. Patching of asphalt and re-striping if required. All locates of existing underground conduit and cable shall be considered incidental to this item. Includes removal of airport signs with concrete bases, and associated light bases. Includes removal of conduit, cable, backfilling of trenches and all other existing electrical equipment and materials that are to be removed. No other payment for removal or re-routing of existing conduit and conductors shall be made outside of this item. Includes re-routing of conduit and conductors, reconnection of cables, connectors as required to reconnect existing circuits so they properly function after removal of a light or sign, etc.

Item L-100n, Airport Sign, Type L-858: Includes sign, L-867 base, frangible couplings, transformer, concrete base, sign faces as shown. Includes concrete pad, conduit with grommet, cabling, L-823 cable connectors, grounding lug and connector, conduit grommets, trenching, bedding, backfilling, compaction, cutting and removal of existing asphalt pavement if present and re-paving if required, and all other work to provide an operational/acceptable sign that is connected to the runway light circuit as shown.

Item L-100ap. Spare Parts: Includes spare parts to be paid by actual invoiced material and deliver cost, plus 15% markup.

Payment will be made under:

Item L-100e	Taxiway Edge Light, L-861T - per each
Item L-100h	Remove Runway and Taxiway Light - per each
Item L-100n	Airport Sign, Type L-858 - per each
Item L-100ap	Spare Parts – per contingent sum

MATERIAL REQUIREMENTS

AC 150/5345-42	<i>Airport Light Bases, Transformer Houses, Junction Boxes and Accessories</i>
AC 150/5345-44	<i>Taxiway and Runway Signs</i>
AC 150/5345-46	<i>Runway and Taxiway Light Fixtures</i>
AC 150/5345-47	<i>Isolation Transformers for Airport Lighting Systems</i>
AC 150/5345-53	<i>Airport Lighting Equipment Certification Program</i>
ATM 207	Moisture-Density Relationship of Soils

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.

This work includes replacing existing taxiway lighting cable, lighted sign cables and providing new taxiway, and lighted sign cables as shown in the Plans.

All conductors and cables rated for 600V or less shall be installed per this section and paid for in other sections unless otherwise noted in another section.

Perform all work necessary to the above systems to make them fully functional and operational at the completion of the work performed under this section.

Remove all unused or replaced portions of the above systems as shown on the drawings.

Furnish all labor, equipment, supplies and materials and perform all operations necessary to complete the work described in this section and work shown on the plans which is covered under this section of the specifications. All work shall comply with the applicable FAA advisory circulars, the National Electrical Code (NEC), and any applicable National Fire Protection Association (NFPA) codes.

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.
- c. 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. The submittal information for any item may not be submitted separately from the bound submittals. All materials for all items (L-100, 108, 110, & 112) shall be submitted in the same bound submittal set for L-100, 108, 110, & 112. If there are more pages than one binder can hold, the submittal shall be split into volumes of more than one binder. If any submittal material in any volume is rejected, all of the volumes have

to be resubmitted as one group. Re-submittals and individual submittals shall not be provided as separate sheets, but shall be included in the bound submittals.

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 B, with ethylene propylene rubber insulation (EPR) with overall jacket of chlorinated polyethylene (CPE). Conductor shall be lead alloy coated, soft annealed stranded copper (Addendum 2).

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 INSULATED COPPER WIRE (COUNTERPOISE OR GROUNDING). Insulated copper wire for counterpoise or grounding installations shall be solid or stranded wire conforming to ASTM B3 and B8.

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. **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.
- b. **Factory-Molded Plug-in Splice.** Specification for L-823 Connectors, Factory-Molded to Individual Conductors, are approved.

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, detectable, 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).

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 isolating 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.

All equipment shall be installed per the manufacturer's recommendations, per the applicable FAA advisory circulars, per these specifications and as shown on the drawings.

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. Blow each conduit section clean prior to installing cable

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.

Install cable connectors in light bases so that the male and female ends are oriented in one direction around the runway perimeter. Install the connector with the plug (male end) on the cable entering the left side of each base as viewed from the runway centerline.

Loop all cables at least one revolution in manholes. Support cables on hangars in manholes.

Do not splice any cable except in a light base and only where it feeds a light. If the cable passes through the light base it shall not be spliced. Runway and Taxiway lighting cables shall not be spliced except at isolation transformers or at the plug cutout in the ARFF building. No exceptions without the ENGINEER's written permission. No other splices in cables routed underground shall be performed without the ENGINEER's written permission.

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 two feet above grade.

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. **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.
- b. **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.

108-3.10 GROUNDING SYSTEM. Install a green insulated copper ground conductor as indicated on the plans. The ground conductor shall extend continuously and shall be securely fastened to all ground rods, metal conduits, metal junction boxes, metal handholes, light bases, light base cover plates, light fixtures, metal portions of handholes and manholes, regulator grounding lug, all building grounding grids, metal building frames, metal poles for lighted wind cones, metal portions of all equipment, etc., and all equipment grounding systems. Utilize irreversible compression splices for all connections to ground rods. Irreversible compression splices shall be Burndy or approved equal. Use exothermic connections to conductors installed underground.

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 2,000 megohms. Where additions to existing circuits, only the new section shall be tested. The resistance to ground of 600 V capacity shall be 1,000 megohms for the insulation test.
- d. That the insulation resistance to ground of all nongrounded 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.

108-3.12 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.

108-3.13 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 Owner, promptly upon notification and to the satisfaction of the Engineer.

108-3.14 INSPECTION. Notify the ENGINEER at least 48 hours prior to installing any cable.

METHOD OF MEASUREMENT

108-4.1 Items shown as lump sum will not be measured for payment. Payment will cover all work described in the item.

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. Payment will cover all work described in the item.

108-4.5 Lump sum items will not be measured for payment. Payment will cover all work described in the item.

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.

Subsidiary work – All work associated with providing the equipment and materials included in this section of the specifications that is not specifically covered in the pay items below shall be considered subsidiary to the pay items below and shall not be paid for separate from the pay items below. This includes any work required to access the area to perform work under this and related items.

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
Item L-108c	#6 Bare Copper Ground Conductor

MATERIAL REQUIREMENTS

AC 150/5345-7	<i>L-824 Underground Electrical Cable for Airport Lighting Circuits</i>
AC 150/5345-26	<i>L-823 Plug and Receptacle Cable Connectors</i>
ASTM B3	Soft or Annealed Copper Wire
ASTM B8	Concentric-Lay-Stranded Cooper Conductor, Hard, Medium-Hard, or Soft

ASTM D4388	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-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. In all locations in this specification section, the word duct applies to both ducts and conduit.

This work includes providing new conduit for new taxiway and runway lights, for new lighted signs, and for lighted wind cones.

Perform all work necessary to the above systems to make them fully functional and operational at the completion of the work performed under this section.

Remove all unused or replaced portions of the above systems as shown on the drawings.

Furnish all labor, equipment, supplies and materials and perform all operations necessary to complete the work described in this section and work shown on the plans which is covered under this section of the specifications. All work shall comply with the applicable FAA advisory circulars, the National Electrical Code (NEC), and any applicable National Fire Protection Association (NFPA) codes.

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.

- a. 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. The submittal information for any item may not be submitted separately from the bound submittals. All materials for all items (L-100, 108, 110, & 112) shall be submitted in the same bound submittal set for L-100, 108, 110, & 112. If there are more pages than one binder can hold, the submittal shall be split into volumes of more than one binder. If any submittal material in any volume is rejected, all of the volumes have to be resubmitted as one group. Re-submittals and individual submittals shall not be provided as separate sheets, but shall be included in the bound submittals.

110-2.4 STEEL CONDUIT. Rigid steel conduit and fittings shall conform to the requirements of UL Standard 6, 514, and 1242. All Rigid Steel conduit shall be hot-dipped galvanized and shall comply with the requirements of ANSI C80.1.

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 D3350, 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 for schedule 40 pipe for the given size. The HDPE conduit shall be manufactured per ASTM D2447. The conduit shall be cooled to room temperature after manufacture and prior to being rolled on a spool. Provide a conduit straightening mechanism to remove the "reel memory" from the conduit.

Provide friction fit, water tight "Double E-Loc" type coupling connectors for all splices involving HDPE conduit. The couplings shall provide an air tight, water tight splice. All other fittings for HDPE conduit such as elbows, threaded connectors and adapters to flexible conduit, etc. shall be GRS. Transitions from HDPE to GRS fittings shall be performed using GRS conduit and "Double E-Loc" type connectors.

For Double E-Loc type couplings the following requirements shall be met: The connectors shall have an elastomeric seal inside a Schedule 80 PVC shell. The seal shall be grooved to enhance the friction fit. The couplings shall have a gripper ring and lock nut on each end. Provide Double E-Loc connectors by ETCO Specialty Products, Inc. or an approved equal.

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. All flexible conduit installed outdoors shall be non-metallic liquid tight with a rigid PVC coil core and smooth outer and inner jacket. Provide Hubbell or equal.

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 1 inch 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.

Joint Compound for rigid steel conduits runs: Compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity. Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

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 conduit installed under runways, taxiways, and aprons and other paved areas shall be galvanized rigid steel conduit.

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. 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 4 inches minimum of below duct or conduit bedding, plus adequate over excavation depth as required to slope and grade all duct or conduit installations to drain toward light bases or hand holes.

All ducts and conduits shall be placed in the bottom of the trench after trenching work is completed, and before backfilling. No plowing in of conduit is allowed.

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.

Protect and preserve all existing pavement throughout the entire construction period. No tracked equipment may be operated on any pavement without first protecting the pavement with pavement pads approved by the Engineer. All pavement which is damaged in any manner by the Contractor's operations shall be restored to the original or better condition at the Contractor's expense. Repair work to the Runway, Taxiway, Apron and roadway shall be in all ways satisfactory to the Owner.

Prior to excavating the trench, all necessary stripping shall be completed in accordance with these specifications and is incidental to the contract.

Crushed aggregate base course shall be placed and compacted to 100% as specified in P-209

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 18 inches, 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.

Where PE (HDPE) or steel conduit is specified, place a layer of bedding material, at least 4 inches thick (loose measurement) in the bottom of the trench to bed the duct. Use bedding material that meets the requirements for the applicable lift of material (P-152, P-154, P-208, P-209) except that 100% of the bedding material will pass a 1 inch sieve.

Where conduit other than PE or steel is specified, a layer of sand, 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, 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. 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.

All HDPE conduit shall be backfilled at the same temperature that it was installed in the trench at and on the same work day. The HDPE conduit shall not be pulled tight in the trench, it shall be laid in the trench and allowed to snake side to side as it lays unrestrained. This extra length taken up by snaking shall not be pulled out of the conduit prior to splicing at each end and backfilling.

HDPE conduit shall be installed continuous between hand holes or bases. HDPE conduit shall not be spliced together to extend the length of conduit to the next handhole or base.

Where it is necessary to cut a piece of conduit at the job site, the cut shall be made true and square with a tool or lathe designed for the purpose. The conduit shall be de-burred and reamed as required.

The HDPE conduit shall be run through a tool recommended by the manufacturer to remove the "reel memory" prior to being placed in a trench.

GRS conduit shall be used for all bends greater than 45 degrees. HDPE conduit may be used for long radius sweeps where the radius exceeds 15 feet.

When placing more than one conduit in a single trench, provide a 2 inch separation between conduits.

Use water if lubrication is needed when installing E-lock couplings. Do not use WD-40 or other lubricants.

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 backfill material as shown on the plans 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, bedding material shall be placed around the ducts and carefully tamped around and over them with hand tampers. Use bedding material that conforms to the requirements specified in subsection 110-3.3 for the type of conduit that is used. Bedding material shall be placed to provide a minimum of 4 inches of cover when compacted over and to the sides of the duct. The remaining trench may be filled with backfill and compacted as shown on the plans. 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.

Backfill and bedding shall be as shown on the plans and shall conform to the applicable section of the specifications.

Remove and dispose of all water entering the excavation. Disposal of water shall be done in a manner to prevent damage or nuisance to adjacent property, and in accordance with all applicable laws and regulations. Pumps shall be adequate to maintain a dry trench during the bedding, conduit, handhole, light base, installation, etc. No backfill may be placed in standing water under any circumstances.

Bedding shall be placed in conformance with the lines and grades shown on the plans and to limits depicted in the Details. Before placing any bedding material, the bottom of the trench shall be hand-raked to remove stones and lumps which will interfere with smooth and complete bedding of all items associated with the electrical work and mechanically compacted. The specified bedding material shall be placed the full width of the trench, and compacted per Section P-209 of these specifications.

After the conduit, handholes, etc., have been placed and approved for covering, the bedding material shall be placed evenly around the structures or over conduit for the full width of the trench. Approval for covering does not imply final acceptance of the conduit, handholes, etc., or relieve the Contractor in any way of responsibility to complete the project in conformance with the plans and specifications.

At least 24 hours prior to commencing backfilling operations, notify the Engineer of the proposed method of compaction. No method will be approved until it has been demonstrated, under actual field condition, that such method will produce the degree of compaction required.

The initial density test at any location will be paid for by the Owner. If initial test shows that the material compaction is not as specified, the Contractor shall modify the compaction methods used, as approved by the Engineer, and have the material re-tested until the tests show that the compaction meets the specification requirements. All tests, after the initial test at any given location, shall be paid for by the Contractor.

Exercise care in all compaction operations to prevent damage to fixtures, boxes, or conduits. Any such items damaged as a result of the above operations shall be removed and replaced at no additional cost to the State.

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.

All surface areas disturbed and/or damaged by trenching, excavation, sorting of materials, or any other construction related activities shall be restored to their original conditions at no cost to the Owner.

110-3.9 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.

110-3.10 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 Owner, promptly upon notification and to the satisfaction of the Engineer.

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. Payment will cover all work described in the item.

Items shown as lump sum will not be measured for payment. Payment will cover all work described in the item.

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.

Subsidiary work – All work associated with providing the equipment and materials included in this section of the specifications that is not specifically covered in the pay items below shall be considered Subsidiary to the pay items below and shall not be paid for separate from the pay items below. This includes any work required to access the area in and across soft ground or muskeg necessary to perform work under this and related items. Bedding and backfill are subsidiary and are not paid under P-209.

Payment will be made under:

- Item L-110a 2-inch Rigid Steel Conduit - per linear foot
- Item L-110c 2-inch PVC Conduit - per linear foot
- Item L-110g 2-inch HDPE 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 L-112 SITE LIGHTING AND GATE ELECTRICAL

112-1.01 Description.

This work shall include furnishing all labor, material, equipment, incidentals and services required to construct and install the complete electrical systems including new apron lighting poles and power feeds to the new gates in conformance with the plans and specifications. All provisions of the contract apply to this section. All work and materials to provide the electrical portion of the new vehicle gate is covered in item F-162 (except the feeder conductors to the gate from the utility junction boxes which are covered in this item).

112-1.02 Drawings.

The electrical drawings indicate the general layout of the complete electrical system.

The Contractor shall field verify scale dimensions on plans since actual locations, distances, and levels will be governed by actual field conditions.

The drawings show the general location of the electrical features only, unless specifically dimensioned thereon. When necessary, to present a symmetrical appearance or to avoid interference with other installations, the Contractor shall make minor relocations as required. The drawings and specifications are complementary to each other and what is called for by one shall be as binding as if called for by both.

Discrepancies shown on the different plans, or between plans and actual field conditions, or between plans and specifications, shall promptly be brought to the attention of the Engineer for resolution.

112-1.03 Approvals.

Within 20 days after Notice to Proceed or at least 30 days prior to the purchase or ordering of any materials or equipment, the Contractor shall submit to the Engineer for approval six (6) copies of the complete brochure of items intended for use in the work. The brochure shall include the item, manufacturer, identifying manufacturer's number or nomenclature and such other information as necessary to properly describe the item. Where substitutions are proposed by the Contractor for the specific items described in the specification, the submittal shall also include six copies of the Manufacturer's bulletins or pamphlets which contain sufficient information to clearly establish the conformity of the proposed substitute item to the requirements of the specification. One copy of the submitted material will be returned with the action to be taken indicated thereon.

112-1.04 Codes Standards and Fees.

The Contractor's work shall comply with the latest State of Alaska adopted Edition of the National Electrical Code and the National Electrical Safety Code, local codes, ordinances, and the requirements of the power company regulations furnishing services to the installation, in effect as of bid date.

The Contractor shall secure and pay for all fees, permits, etc., required by local and State agencies for work specified in this specification.

112-2.01 Materials and Equipment, General.

All materials, supplies and equipment shall be new and shall be the standard products of manufacturers regularly engaged in the production of such items and shall be the manufacturer's latest standard design. Like items of equipment shall be the product of a single manufacturer.

All wiring shall have XHHW insulation with copper conductors, rated at 600V.

All poles and mounting hardware shall be hot dipped galvanized.

All circuit breakers shall be made by the same manufacturer as the panel they are installed in and rated for 10,000 AIC.

112-3.01 Construction Requirements, General.

The installation shall comply with all laws applying to electrical installations in effect and with the regulations of the National Electrical Code where such regulations do not conflict with the laws in effect.

112-3.02 Tests and Inspections.

A. Request inspection at least 72 hours prior to covering of any buried or concealed work; pulling of wires and cable; installation of lighting fixtures, or placing of covers on outlets, cabinets, panelboards, or switchgear.

B. Notify the engineer at least 72 hours prior to conducting any tests.

Tests. After completion of the entire electrical installation and at such time as the Engineer may direct, the Contractor shall conduct an operation test. The equipment shall be demonstrated to operate in the manner specified in the drawings and with the requirements of these specifications. These tests shall be accomplished in the presence of the Engineer or his authorized representative. These tests may include the insulation resistance tests of all wire and cables. The Contractor shall furnish all personnel and equipment necessary for the tests.

Following completion of installation, test system ground for continuity and test resistance to ground by "fall of potential" method. Test all feeders with appropriate meggers, or other approved instruments and methods, to determine ground and insulation resistance values. Submit logs of values obtained.

112-4.01 Method of Measurement.

When the bid schedule contains a lump sum pay item for Apron Flood Lighting, no measurement of quantities shall be made.

112-5.01 Basis of Payment.

When called for on the bid schedule, Electrical Power and Lighting System shall be paid for at their respective contract lump sum price.

Lump sum price paid shall be considered full compensation for providing all labor, materials, equipment and incidentals to provide all of the site lighting system and all electrical for the new gates. This includes piles for light poles, light poles, luminaires, load centers, gate power and controls, gate controllers, card access equipment, computer network equipment, circuit breakers, wiring from load centers to the equipment, and all other work required in conformance with the plans and specifications complete-in-place and accepted. Removal of existing site lighting feeder cables, new site lighting feeder conductors, (from load centers to all lights) new Type 1A J-boxes at each site light, and all other electrical work and materials not specifically covered in other bid items shall be considered incidental to this bid item. The 2" PVC conduit used for feeding site lights and gate shall be paid for under item L-110. All excavation, backfilling, concrete foundations, cutting and patching of existing asphalt, and all other work and materials required to install the new j-boxes, conduit, light poles, and all other equipment covered in this item shall be considered incidental to this pay item. All excavation, backfilling, concrete, asphalt cutting, and patching shall be done per the applicable specification sections and considered incidental to this pay item.

Payment will be made under:

Item L-112 Site Lighting and Gate Electrical - per Lump Sum

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.
- h. **Ditch Lining.** Use crushed or naturally occurring stones that are sound and durable, are not larger than 8 inches in greatest dimension, and containing not more than 50% by weight passing a 3-inch sieve and not more than 5% by weight passing the 1-in sieve as determined by ATM 304, or as accepted by the Engineer.
- i. **Bedding.** Use one of the following materials: Suitable material as defined in specification subsection P-152-2.3, except that 100% of the material will pass a 1 inch sieve. P-209 Crushed Aggregate Base Course (D-1).

152-2.2 UNSUITABLE MATERIAL. Material that does not meet the testing requirement for suitable material. Material containing vegetable or organic matter, such as muck, peat, organic silt, or sod is considered unsuitable for use in embankment construction. Material that is contaminated by hazardous

substances, including fuel or oil, in greater quantity than state and federal standards allow is considered unsuitable for use.

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

- a. Sand, rock, gravel, silt, concrete, asphalt pavement, and other inorganic material;
- b. Gradation of 100% by weight passing 6 inch screen; and
- c. Meets definition of Non-Frost Susceptible in 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.

Excess Suitable or 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 CBJ 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 through 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 Owner, 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 below the subgrade, or to the depth directed by the Engineer. Muck, peat, matted roots, or other yielding material that is unsatisfactory for foundation soil compaction, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the Plans. The excavated area shall be backfilled with suitable material, obtained from the grading operations or borrow areas and thoroughly compacted as specified. Where rock cuts are made and backfilled with suitable material. Any pockets created in the rock surface shall be drained according to the details shown on the Plans. The material removed will be paid as Unclassified Excavation.
- c. **Overbreak.** Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work, as planned or authorized by the Engineer. All overbreak shall be graded or removed by the Contractor and disposed of as directed by the Engineer. Payment will not be made for the removal and disposal of overbreak which the Engineer determines as avoidable. Unavoidable overbreak will be paid as Unclassified Excavation.
- d. **Removal of Structures and Utilities.** The Contractor shall accomplish the removal of existing structures and utilities that are specified to be removed or demolished, except when another

entity is identified in the Contract to accomplish the work. All existing structural foundations shall be excavated and removed to a depth at least 2 feet below the top of subgrade or as indicated on the Plans, and the material disposed of as directed. Holes left after removing foundations shall be backfilled with suitable material and compacted as specified. The material will be paid as Unclassified Excavation.

- e. **Foundation Soil Compaction Requirements.** In areas of excavation, the top 6 inches of foundation soil under areas serving aircraft or vehicle traffic loadings shall be compacted to a density of not less than 95% of the maximum density as determined by ATM 207 ATM 212, or ATM 309. The in-place field density and moisture content shall be determined according to ATM 213.

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

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

Blasting. Blasting will not be permitted on airport property **152-3.3 BORROW SOURCES.** Borrow sources within the airport property if available will be identified on the Plans. Excavation of borrow on airport property shall be made only at these identified locations and within the lines and grades staked.

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

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

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

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

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

152-3.5 PREPARATION OF EMBANKMENT AREA. Where an embankment is to be constructed to a height of 4 feet or less, or where the embankment paved or surfaced areas, 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 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, the existing ground shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. 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, and compacted as specified for the adjacent fill.

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

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

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

- a. **Suspension of Operations.** Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, moisture content or other unsatisfactory conditions of the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.
- b. **Soft Foundations.** When embankments are to be constructed across wet or swampy ground, which will not support the weight of heavy hauling and spreading equipment, the Contractor shall use methods of embankment construction, and use hauling and spreading equipment, that will least disturb the soft foundation (defined as having a California Bearing Ratio less than 3). When soft foundations are encountered, and when approved by the Engineer, the lower part of the fill may be constructed by dumping and spreading successive vehicle loads in a uniformly distributed layer of a thickness not greater than that necessary to support the vehicle while placing subsequent layers, after which the remainder of the embankment shall be constructed in layers and compacted as specified. The Contractor shall not be required to compact the soft foundation, and at the Engineer's option, may not be required to clear and grub.
- c. **Moisture.** The material in the layer being placed shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be performed when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Watering of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times.
- d. **Compaction.** Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density as determined by ATM 207 or ATM 212. Under all areas serving aircraft or vehicle traffic loadings, the embankment shall be compacted to a density of not less than 98% of the maximum density as determined by ATM 207 or ATM 212. The in-place field density and moisture content shall be determined according ATM 202.

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

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

In the construction of embankments, layer placement shall begin in the deepest portion of the fill and progress in layers approximately parallel to the finished pavement grade line. Stones or

fragmentary rock larger than 3 inches in their greatest dimensions will not be allowed in the top 6 inches of the embankment.

- e. **Oversize Material.** At the Engineer's discretion and direction, the Contractor may use oversize material or rockfill, as defined in Subsection 152-2.3, in the embankment. Place material in layers up to 2 feet thick. Fill voids with finer material. Level and smooth each layer with suitable leveling equipment. Use compaction equipment and construction methods that can form a dense, well-compacted embankment. Do not use oversize material within 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, diking, watering, mixing, sloping, grading, and other necessary operations for construction of embankments, are subsidiary and shall be included in the contract unit prices for excavation, borrow, or other pay items.
- g. **Frozen Material.** Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material, unless this construction method is identified in the special provisions, or is part of a Contractor's Progress Schedule that the Engineer has approved.

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

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

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

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

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

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

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.

152-4.3 If material is pay for per lump sum it shall not be measured for payment.

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, diskings, 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

TESTING REQUIREMENTS

ATM 212	Standard Density of Coarse Granular Materials using the Vibratory Compactor
ATM 207	Moisture-Density Relationship of Soils
ATM 202	Moisture Content of Aggregate and Soils
ATM 213	In-place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods
ATM 304	Sieve Analysis of Fine and Coarse Aggregates

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. 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 ATM 304.

TABLE 1. AGGREGATE GRADATION REQUIREMENTS

Sieve designation (Square opening)	Percentage by weight passing sieves
3 inch	90-100
No. 4	20-55
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 ATM 204 and ATM 205.

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 98% of the maximum density, as determined according to ATM 207 or ATM 212. The in-place field density and moisture content shall be determined according to ATM 213.

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 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-154b Subbase Course - per ton

TESTING REQUIREMENTS

ATM 212	Standard Density of Coarse Granular Materials using the Vibratory Compactor
ATM 304	Sieve Analysis of Aggregates & Soils
ATM 204	Liquid Limit of Soils
ATM 205	Plastic Limit and Plasticity Index of Soils
ATM 207	Moisture-Density Relationship of Soils
ATM 213	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. Provide project administration and Work relating to control of erosion, sedimentation, and discharge of pollutants, according to this section and applicable local, state, and federal requirements, including the Alaska Pollutant Discharge Elimination System (APDES) Construction General Permit. Section 301(a) of the Clean Water Act (CWA) and 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except in accordance with the permit.

157-1.2 DEFINITIONS.

These definitions apply only to Item P-157.

ACTIVE TREATMENT SYSTEM OPERATOR (ATS). The Contractor's qualified representative who is responsible for maintaining and operating an active treatment system (as defined in the CGP) for storm water runoff.

ALASKA CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (AK-CESCL). A person who has completed training, testing, and other requirements of, and is currently certified as, an AK-CESCL from an AK-CESCL Training Program (a program developed under a Memorandum of Understanding between the Owner and others). The Owner recognizes AK-CESCLs as "qualified personnel" required by the CGP. An AK-CESCL must be recertified every three years.

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC). The state agency authorized by EPA to administer the Clean Water Act's National Pollutant Discharge Elimination System.

ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM (APDES). A system administered by DEC that issues and tracks permits for storm water discharges.

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 minimize 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, or drainage from material storage.

CLEAN WATER ACT (CWA). Federal Water Pollution Control Amendments of 1972, as amended (33 U.S.C. 1251 et seq.).

CONSTRUCTION ACTIVITY. Physical activity by the Contractor, Subcontractor or utility company; that may result in erosion, sedimentation, or a discharge of pollutants into storm water. Construction Activity includes soil disturbing activities (e.g. clearing, grubbing, grading, excavating); and establishment of construction materials or equipment storage or maintenance areas (e.g. material piles, borrow area, concrete truck chute washdown, fueling); and industrial activities that may discharge storm water and are directly related to the construction process (e.g. concrete or asphalt batch plants).

CONSTRUCTION GENERAL PERMIT (CGP). The permit authorizing storm water discharges from Construction Activities, issued and enforced by DEC. It authorizes stormwater discharges provided permit conditions and water quality standards are met. The CGP document can be found online at:

http://dec.alaska.gov/water/wnpssp/stormwater/docs/2016_cgp_akr10_final_20151229.pdf

CORPS OF ENGINEERS PERMIT (USACE PERMIT). A U.S. Army Corps of Engineers Permit for construction in waters of the US. Such permit may be issued under Section 10 of the Rivers and Harbors Act of 1899, or Section 404 of the Clean Water Act.

ELECTRONIC NOTICE OF INTENT (ENOI). The electronic Notice of Intent submitted to DEC, to obtain coverage under the CGP.

ELECTRONIC NOTICE OF TERMINATION (ENOT). The electronic Notice of Termination submitted to DEC, to end coverage under the CGP.

ENVIRONMENTAL PROTECTION AGENCY (EPA). A federal agency charged to protect human health and the environment.

ERODIBLE STOCKPILE. Any material storage area or stockpile consisting of mineral aggregate, organic material, or a combination thereof, with greater than 5% passing the #200 sieve, and any material storage where wind or water transports sediments or other pollutants from the stockpile. Erodible Stockpile also includes any material storage area or stockpile where the Engineer determines there is potential for wind or water transport of sediments or other pollutants away from the stockpile.

EROSION AND SEDIMENT CONTROL PLAN (ESCP). The Owner's project specific document that illustrates measures to control erosion and sediment on the project. The ESCP provides bidders with the basis for cost estimating and guidance for developing an acceptable Storm Water Pollutant Prevention Plan (SWPPP).

FINAL STABILIZATION. Is defined in Item P-157 as it is defined in the CGP.

HAZARDOUS MATERIAL CONTROL PLAN (HMCP). The Contractor's detailed project specific plan for prevention of pollution from storage, use, transfer, containment, cleanup, and disposal of hazardous material (including, but are not limited to, petroleum products related to construction activities and equipment). The HMCP is included as an appendix to the SWPPP.

IMMEDIATELY. Means no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

INSPECTION. An inspection required by the CGP or the SWPPP, usually performed together by the Contractor's SWPPP Manager and CBJ's Stormwater Inspector.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT. A DEC storm water discharge permit issued to certain local governments and other public bodies, for operation of storm water conveyances and drainage systems. See CGP for further definition.

MULTI-SECTOR GENERAL PERMIT (MSGP). The Alaska Pollutant Discharge Elimination System General Permit for storm water discharges associated with industrial activity.

NON-ERODIBLE STOCKPILE. Any material stockpile identified in the CGP definition for Final Stabilization, Section 1.b, and includes: riprap, gabion backfill, porous backfill, railroad ballast and sub-ballast, ditch lining, or fill material with low erodibility. The stockpile shall not have a gradation of more than 5% passing the #200 sieve unless approved by an Engineer. There shall be no possibility of sediment transport due to water or wind erosion. Crushed aggregate base material as defined in Item P-209 is only considered stable on relatively flat slopes when compacted in accordance with P-209-3.5

OPERATOR(S). The party or co-parties associated with a regulated activity that has responsibility to obtain permit coverage under the CGP. "Operator" for the purpose of the CGP and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

- a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

- b. The party has day to day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g. they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

POLLUTANT. Any substance or item meeting the definition of pollutant contained in 40 CFR § 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sediment, sewage, garbage, sewage sludge, chemical wastes, biological materials, wrecked or discarded equipment, rock, sand, cellar dirt and industrial or municipal waste.

PROJECT ZONE. The physical area provided by the Owner for Construction. The Project Zone includes the area of highway or facility under construction, project staging and equipment areas, and material and disposal sites; when those areas, routes and sites, are provided by the Contract.

Material sites, material processing sites, disposal sites, haul routes, staging and equipment storage areas; that are furnished by the Contractor or a commercial operator, are not included in the Project Zone.

RECORDS. Any record, report, information, document or photograph required to be created or maintained pursuant to the requirements of, the CGP, the CGP storm water requirements of the Clean Water Act; and applicable local, state, and federal laws and regulations regarding document preservation.

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC PLAN). The Contractor's detailed plan for petroleum spill prevention and control measures, that meet the requirements of 40 CFR 112.

SPILL RESPONSE FIELD REPRESENTATIVE. The Contractor's representative with authority and responsibility for managing, implementing, and executing the HMCP and SPCC Plan.

STORM EVENT. A rainfall event that produces 0.5 inch or more of precipitation in 24 hours and that is separated from the previous storm event by at least 3 days of less than 0.1 inch of rain per day.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP). The Contractor's detailed project specific plan to minimize erosion and contain sediment within the Project Zone, and to prevent discharge of pollutants that exceed applicable water quality standards. The SWPPP includes, but is not 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, and other applicable local, state, and federal laws and regulations.

STORM WATER POLLUTION PREVENTION PLAN TWO (SWPPP2). The Contractor's detailed project specific plan to comply with CGP or MSGP requirements, for Contractor construction-related activities outside the Project Zone.

SUBCONTRACTOR SPILL RESPONSE COORDINATOR. The subcontractor's representative with authority and responsibility for coordinating the subcontractor's activities in compliance with the HMCP and SPCC Plan.

SUBCONTRACTOR SWPPP COORDINATOR. The subcontractor's representative with authority to direct the subcontractor's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the subcontractor's compliance with the SWPPP.

SUPERINTENDENT. The Contractor's duly authorized representative in responsible charge of the work. 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 who conducts Inspections, updates SWPPP records, and has authority to suspend work and to implement corrective actions required for CGP compliance.

SWPPP PREPARER. The Contractor's qualified representative who is responsible for developing the initial SWPPP.

TEMPORARY STABILIZATION. Protecting soils from erosion and sediment loss by rainfall, snow melt, runoff, or wind with a temporary vegetative and/or non-vegetative protection cover. Temporary stabilization may include a combination of seeding, geotextiles, mulches, surface tackifiers, rolled erosion control products, gravel or paving, or the mentioned BMP's combined together with track walking.

UTILITY SPILL RESPONSE COORDINATOR. The Utility's representative with authority and responsibility for coordinating the Utility's activities in compliance with the HMCP and SPCC Plan.

UTILITY SWPPP COORDINATOR. The Utility's representative with authority to direct the Utility's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the Utility's compliance with the SWPPP.

157-1.3 PLAN AND PERMIT SUBMITTALS.

For plans listed in Subsection GCP-80-03.f (SWPPP and HMCP), use the Contractor submission and CBJ review deadlines identified in Subsection 157-1.3.

Partial and incomplete submittals will not be accepted for review. Any submittal that is re-submitted or revised after submission, but before the review is completed, will restart the submittal review timeline. No additional Contract time or additional compensation will be allowed due to delays caused by partial or incomplete submittals, or required re-submittals.

- a. **Storm Water Pollution Prevention Plan.** Submit an electronic copy and three hard copies of the SWPPP to the Engineer for approval. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity. Organize and bind the SWPPP and related documents for submittal according to the requirements of Subsection 157-2.1.b.

The Owner will review the SWPPP submittals within 14 days after they are received. Submittals will be returned to the Contractor, and marked as either "rejected" with reasons listed or as "approved" by the Owner. When the submittal is rejected, the Contractor must revise and resubmit the SWPPP. The 14 day review period will restart when the contractor submits an electronic copy and three hard copies of the revised SWPPP to the Engineer for approval.

After the SWPPP is approved by the Owner, the Contractor must sign and certify the approved SWPPP Form 25D-111. See Item 4-d for further SWPPP submittal requirements.

- b. **Hazardous Material Control Plan.** The HMCP Template can be found at the following webpage: http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml. Submit an electronic copy and three hard copies of the HMCP, as an appendix to the SWPPP, to the Engineer for approval. The HMCP submittal and review timeline, and signature requirements are the same as the SWPPP.
- c. **Spill Prevention, Control and Countermeasure Plan.** When a SPCC Plan is required under Subsection 157-2.3, submit an electronic copy and three signed hard copies of the SPCC Plan to the Engineer. Deliver these documents to the Engineer at least 21 days before beginning

Construction Activity. The Owner reserves the right to review the SPCC Plan and require modifications.

- d. **CGP Coverage.** The Contractor is responsible for permitting of Contractor and subcontractor Construction Activities related to the Project. Do not use the SWPPP for Construction Activities outside the Project Zone where the Owner is not an operator. Use a SWPPP2 for Construction Activities outside the Project Zone.

After CBJ approval of the SWPPP and prior to beginning Construction Activity, submit an eNOI with the required fee to DEC for coverage under the Construction General Permit (CGP). Submit a copy of the signed eNOI and DEC's written acknowledgement (by letter or other document), to the Engineer as soon as practicable and no later than three days after filing eNOI or receiving a written response.

Do not begin Construction Activity until the conditions listed in Subsection 157-3.1.a are completed.

The Owner will submit an eNOI to DEC for Construction Activities inside the Project Zone. The Engineer will provide the Contractor with a copy of the Owner's eNOI and DEC's written acknowledgment (by letter or other document), for inclusion in the SWPPP.

Before Construction Activities occur, transmit to the Engineer an electronic copy of the approved and certified SWPPP, with signed Delegations of Signature Authorities Forms 25D-107 and 25D-108, SWPPP Certifications Forms 25D-111 and 25D-109, both permittee's signed eNOIs and DEC's written acknowledgement.

- e. **Ending CGP Coverage.** Submit an eNOT to DEC within 30 days after the Engineer has determined the conditions listed in Subsection 157-3.1.f have been met. Submit a copy of the signed eNOT and DEC's acknowledgement letter to the Owner within three days of filing the eNOT or receiving a written response.

- f. **DEC SWPPP Review.** When CGP Part 2.1.3, requires DEC SWPPP review:

- (1) Transmit a copy of the CBJ-approved SWPPP to DEC using delivery receipt confirmation;
- (2) Transmit a copy of the delivery receipt confirmation to the Engineer within seven (7) days of receiving the confirmation; and
- (3) Retain a copy of delivery receipt confirmation in the SWPPP.

- g. **Local Government SWPPP Review.** When local government or the CGP Part 2.1.4, requires local government review:

- (1) Transmit a copy of the CBJ-approved SWPPP and other information as required to local government, with the required fee. Use delivery receipt confirmation;
- (2) Transmit a copy of the delivery receipt confirmation to the Engineer within seven days of receiving the confirmation;
- (3) Transmit a copy of any comments by the local government to the Engineer within seven days of receipt;
- (4) Amend the SWPPP as necessary to address local government comments and transmit SWPPP Amendments to the Engineer within seven days of receipt of the comments;

- (5) Include a copy of local government SWPPP review letter in the SWPPP; and
- (6) File a notification with local government that the project is ending.

h. Modifying Contractor's eNOI. When required by the CGP Part 2.7, modify your eNOI to update or correct information within 30 calendar days of the change. Reasons for modification include a change in start or end dates, change in Owner/Operator address and contact information, change in site information, any changes in number of acres to be disturbed, change in decision to use or not use treatment chemicals, or change in location of SWPPP records.

The Contractor must submit an eNOT and then submit a new eNOI instead of an eNOI modification when:

- (1) the operator has changed;
- (2) the project will disturb more than five (5) acres when the original eNOI indicated the project would disturb less than five (5) acres; or
- (3) A project with a disturbed area greater than five (5) acres grows by more than 50%.

157-1.4 PERSONNEL QUALIFICATIONS. Provide documentation in the SWPPP that the individuals serving in these positions meet the personnel qualifications.

a. The SWPPP Preparer must meet at least one of the following qualifications:

- (1) Current certification as a Certified Professional in Erosion and Sediment Control (CPESC);
- (2) Current certification as AK-CESCL, and at least two years' experience in erosion and sediment control, as a SWPPP Manager or SWPPP writer, or equivalent. Provide documentation including project names, project timelines, and work responsibilities demonstrating the experience requirement;
- (3) Professional Engineer registered in the State of Alaska with current certification as AK-CESCL; or
- (4) For Projects disturbing more than 20 acres, the SWPPP Preparer must also have completed a SWPPP Preparation course.

b. The Superintendent must meet the following qualifications:

- (1) Current certification as AK-CESCL; and
- (2) Duly authorized representative, as defined in the CGP, Appendix A, Part 1.12.3.

c. The SWPPP Manager must have current certification as AK-CESCL and must meet the CGP experience, training, and authority requirements identified for the Storm Water Lead and Storm Water Inspector positions as defined in the CGP, Appendix C, Qualified Person.

d. The ATS operator, as defined in CGP Appendix C Definitions, Qualified Person, must have current certification as AK-CESCL, and be knowledgeable in the principals and practices of treatment systems in general, and the operation of the project-specific ATS. The ATS operator must have at least three months field experience with ATS, or completion of an ATS manufacturer's training course, or completion of system operators certification course.

- e. The Owner accepts people having any of the following certificates as equivalent to AK-CESCL, if the certificates are current according to the sponsoring organization's policies:

- (1) CPESC, Certified Professional in Erosion and Sediment Control; or

- (2) CISEC, Certified Inspector in Sediment and Erosion Control.

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 according to CGP Appendix A, Part 1.12. Signature and certification authority for the eNOI and eNOT cannot be delegated.

- b. **Delegation of Signature Authority for Other SWPPP Documents and Reports.** Use Form 25D-108 to delegate signature authority and certification authority to the Superintendent position, according to CGP Appendix A, Part 1.12.3, for the SWPPP, Inspection Reports and other reports required by the CGP. The Superintendent position is responsible for signing and certifying the SWPPP, Inspection Reports, and other reports required by the CGP, except the eNOI and eNOT.

The Engineer will provide the Owner's delegation Form 25D-107, which the Contractor must include in the SWPPP.

- c. **Subcontractor Certification.** Subcontractors must certify that they have read and will abide by the CGP and the conditions of the project SWPPP Form 25D-105.

- d. **Signatures and Initials.** Handwrite signatures or initials on CGP documents and SWPPP forms, wherever a signature or initial is required.

157-1.6 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE.

- a. The Owner and the Contractor are jointly responsible for permitting and permit compliance within the Project Zone.

- b. The Contractor is responsible for permitting and permit compliance outside the Project Zone. The Contractor has sole responsibility for compliance with DEC, USACE, and other applicable federal, state, and local requirements, and for securing all necessary clearances, rights, and permits. Subsection GCP-70-02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.

- c. An entity that owns or operates, a commercial plant (as defined in Subsection GCP- 80-01.d) or material source or disposal site outside the Project Zone, is responsible for permitting and permit compliance. The Contractor has sole responsibility to verify that the entity has appropriate permit coverage. Subsection GCP-70-02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.

- d. The Owner is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:

- (1) For areas outside the Project Zone;

- (2) For Construction Activity and Support Activities outside the Project Zone; and

- (3) For commercial plants, commercial material sources, and commercial disposal sites.

157-1.7 UTILITY. (Reserved for Regions)

157-2.1 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.

a. SWPPP Preparer and Pre-Construction Site Visit.

Use a SWPPP Preparer to develop the SWPPP and associated documents, according to the requirements of the CGP and USACE permit. The SWPPP Preparer must put their name, qualifications (including the expiration date of any certifications), title and company name in the SWPPP.

The SWPPP Preparer must conduct a pre-construction inspection at the Project site before construction activity begins. If the SWPPP Preparer is not a Contractor employee, the SWPPP Preparer must visit the site accompanied by the Contractor. Give the Owner at least seven days' notice of the site visit, so that the Owner may participate.

During the pre-construction inspection, the SWPPP Preparer must identify, or if a draft of the SWPPP has already been prepared verify that the SWPPP fully addresses and describes:

- (1)** Opportunities to phase construction activities;
- (2)** Appropriate BMPs and their sequencing; and
- (3)** Sediment controls that must be installed prior to beginning Construction Activities.

Document the SWPPP Preparer's pre-construction inspection in the SWPPP on Form 25D-106, SWPPP Pre-Construction Site Visit, including the names of attendees and the date.

b. Developing the SWPPP.

Use the Owner's ESCP, Environmental commitments, and other Contract documents as a starting point for developing the SWPPP. The approved SWPPP replaces the ESCP. BMPs identified in the ESCP must be addressed in the SWPPP.

Develop the SWPPP with sections and appendices, according to the current CBJ SWPPP template. Include information required by the Contract and described in the CGP Part 5.0.

- (1)** Obtain the following forms after they have been completed by the Owner and include them in the SWPPP:
 - (a)** SWPPP Delegation of Signature Authority – CBJ (25D-107)
 - (b)** SWPPP Certification for CBJ (25D-109)
 - (c)** SWPPP Delayed Action Item Report (25D-113), if needed completed by the Engineer
 - (d)** Use the following CBJ forms for recording information in the SWPPP:
 - (e)** SWPPP Amendment Log (25D-114)
 - (f)** SWPPP Certification for Contractor (25D-111)
 - (g)** SWPPP Construction Site Inspection Report (25D-100)
 - (h)** SWPPP Corrective Action Log (25D-112)
 - (i)** SWPPP Daily Record of Rainfall (25D-115)

- (j) SWPPP Delegation of Signature Authority – Contractor (25D-108)
- (k) SWPPP Grading and Stabilization Activities Log (25D-110)
- (l) SWPPP Pre-Construction Site Visit (25D-106)
- (m) SWPPP Project Staff Tracking (25D-127)
- (n) SWPPP Subcontractor Certification (25D-105)
- (o) SWPPP Training Log (25D-125)
- (p) SWPPP Noncompliance (25D-143)

SWPPP Template, forms, and instructions are available online at:

http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml

Compile the SWPPP in three ring binders with tabbed and labeled dividers for each section and appendix.

c. SWPPP Considerations and Contents.

- (1) The SWPPP must provide erosion and sediment control measures for all Construction Activity within the Project Zone. Construction activity outside the Project Zone must have permit coverage, using a separate SWPPP2, and separate Contractor Inspections.
- (2) The SWPPP must consider the activities of the Contractor and all subcontractors and utility companies performing work in the Project Zone. The SWPPP must describe the roles and responsibilities of the Contractor, subcontractors, utility companies, and the Owner with regard to implementation of the SWPPP. The SWPPP must identify all operators for the Project, including utility companies performing Construction Activity, and identify the areas:
 - (a) Over which each operator has operational control; and
 - (b) Where the Owner and Contractor are co-operators.
- (3) For work outside the Project Zone the SWPPP must identify the entity that has stormwater permit coverage, the operator, and the areas that are:
 - (a) Dedicated to the Project and where the Owner is not an operator; and
 - (b) Not dedicated to the project, but used for the project.

Dedicated to the Project areas are concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas, provided they are directly related to the Project, are not a commercial operation serving multiple unrelated construction projects by different permittees, do not operate beyond the completion of the construction activity of the Project, and appropriate control measures are identified in the SWPPP covering the discharges from the area.

- (4) Develop the SWPPP according to the requirements of the CGP Part 5.0 and this specification. Account for the Contractor's construction methods and phasing. Identify the amount of mean annual precipitation.

- (5)** Comply with the CGP Part 1.4.3 Authorized Non-Storm Water Discharges. List locations where authorized non-storm water will be used, including the types of water that will be used on-site.
- (6)** Include the CBJ's Anti-degradation Analysis in the SWPPP if storm water from the Project Zone discharges into receiving water that is considered a high quality water and that constitutes an outstanding national resource, according to CGP Part 2.1.6.
- (7)** There are special requirements in the CGP Part 3.2, for storm water discharges into an impaired water body, and they may include monitoring of storm water discharges. For Projects meeting the permit criteria, the Contractor will implement a monitoring plan approved by the Owner for the storm water within the Project Zone, and will provide the required information and reports for inclusion in the SWPPP. The Contractor is responsible for monitoring and reporting outside the Project Zone.
- (8)** Preserve natural topsoil unless infeasible. Delineate the site according to CGP Part 4.2.1. Use stakes, flags, or silt fence, etc. to identify areas where land disturbing activities will occur and areas that will be left undisturbed. Minimize the amount of soil exposed during Construction activity according to CGP Part 4.2.2.
- (9)** Comply with CGP Part 4.4 and the DEC General Permit for Excavation Dewatering (AKG0020000), requirements for dewatering for trenches and excavations.
- (10)** 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.
- (11)** Describe methods and time limits, to initiate temporary or permanent soil stabilization. For areas with mean annual precipitation of:
 - (a)** Less than 40 inches, initiate stabilization immediately and within 14 days; or
 - (b)** 40 inches or greater, initiate stabilization immediately and within seven (7) days.
- (12)** Within seven days of initiating final stabilization, either complete final stabilization or continue maintenance of work until final stabilization is complete. Temporary stabilization must be completed as soon as practicable, but no later than fourteen days after initiating stabilization per CGP Part 4.5.1.2.
- (13)** Include in the "Stabilize Soils" section of the SWPPP, a description of how you will minimize the amount of disturbed and unstabilized ground in the fall season to prepare for spring thaw. Identify anticipated dates of fall freeze-up and spring thaw. Describe how you will stabilize areas when it is close to or past the seasonal time of snow cover or frozen conditions, and before the first seasonal thaw. Include a plan for final stabilization.
- (14)** Plans for Active Treatment Systems must be submitted to DEC and the ATS Operator identified in the SWPPP for review at least 14 days prior to their use. Any use of treatment chemicals must be identified on the NOI, documented in the SWPPP, and meet the requirements of CGP Part 4.6.
- (15)** The SWPPP must provide designated areas for equipment and wheel washing, equipment fueling and maintenance, chemical storage, staging or material storage, waste or disposal sites, concrete washouts, paint and stucco washouts, and sanitary toilets. These activities must be done in designated areas that are located, to the extent practicable, away from drain inlets, conveyance channels, and waters of the US. No discharges are allowed from concrete

washout, paint and stucco washout; or from release oils, curing compounds, fuels, oils, soaps, and solvents. Equipment and wheel washing water that doesn't contain detergent may be discharged on-site if it is treated before discharge.

- (16) Design temporary BMPs for a 2 year 24 hour precipitation amount. Describe BMPs in the SWPPP and in SWPPP Amendments, including source controls, sediment controls, discharge points, and temporary and permanent stabilization measures. Describe the design, placement, installation, and maintenance of each BMP, using words and drawings as appropriate. Describe the design capacity of sediment basins (including sediment ponds and traps). Provide a citation to the BMP Manual or publication used as a source for the BMP, including the manufacturer's or BMP manual specifications for installation CGP Part 5.3.6.2. If no published source was used to select or design a BMP, then the SWPPP or SWPPP amendment must state that "No BMP manual or publication was used for this design."
- (17) Describe the sequence and timing of activities that disturb soils and of BMP implementation and removal. Phase earth disturbing activities to minimize unstabilized areas, and to achieve temporary or final stabilization quickly. Whenever practicable incorporate final stabilization work into excavation, embankment and grading activities. Include drawings showing each phase of the project with the BMPs implemented in the phase.
- (18) Provide a legible site map or set of maps in the SWPPP, showing the entire site and identifying boundaries of the property where construction and earth-disturbing activities will occur or have occurred, as described in the CGP Part 5.3.5. All BMPs must be noted on the site map.
- (19) Identify the inspection frequency in the SWPPP and conduct inspections once every seven (7) days regardless of the precipitation amount.
- (20) Linear Project Inspections, described in CGP Part 6.5, are not applicable to this contract.
- (21) The SWPPP must cite and incorporate applicable requirements of the Project permits, environmental commitments, USACE permit, and commitments related to historic preservation. Make additional consultations or obtain permits as necessary for Contractor specific activities which were not included in the Owner's permitting and consultation.
- (22) The SWPPP is a dynamic document. Keep the SWPPP current by noting installation, modification, and removal of BMPs, and by using amendments, SWPPP amendment logs, Inspection Reports, corrective action logs, records of land disturbance and stabilization, and any other records necessary to document storm water pollution prevention activities and to satisfy the requirements of the CGP and this specification. See Subsection 157-3.3 for more information.

d. Recording Personnel and Contact Information in the SWPPP.

Identify the SWPPP Manager as the Storm Water Lead and Storm Water Inspector positions in the SWPPP. Document the SWPPP Manager's responsibilities in Section 2.0 Storm Water Contacts, of the SWPPP template and:

- (1) Identify that the SWPPP Manager does not have authority to sign inspection reports (unless the SWPPP Manager is also the designated project Superintendent).
- (2) Identify that the SWPPP Manager cannot prepare the SWPPP unless the SWPPP Manager meets the Contract requirements for the SWPPP Preparer.

Include in the SWPPP, proof of AK-CESCL, or equivalent certifications for the Superintendent and SWPPP Manager, and for any acting Superintendent and acting SWPPP Managers. If the Superintendent or SWPPP Manager is replaced permanently or temporarily, by an acting Superintendent or acting SWPPP Manager; record in the SWPPP (Form 25D-127) the names of the replacement personnel, the date of the replacement. For temporary personnel record their beginning and ending dates.

Provide 24 hour contact information for the Superintendent and SWPPP Manager. The Superintendent and SWPPP Manager must have 24 hour contact information for all Subcontractor SWPPP Coordinators and Utility SWPPP Coordinators. The NOI must contain project office or project mobile phone contact information for the Project Engineer and the Project Superintendent with signatory authority.

Include in the SWPPP, proof of AK-CESCL, or equivalent certifications of ATS operators. Record names of ATS operators and their beginning and ending dates, on Form 25D-127.

The Owner will provide proof of AK-CESCL, or equivalent certifications for the Project Engineer, Stormwater Inspectors, and Monitoring Person (if applicable), and names and dates they are acting in that position. Include the Owner's Records in the SWPPP Appendix E. Include the Owner's Storm Water Inspector and Storm Water Monitoring Person (if applicable) in Section 2.0 of the SWPPP.

157-2.2 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS.

Prepare the HMCP using the DOT&PF template located at the following DOT&PF link; (http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml) for prevention of pollution from storage, use, containment, cleanup, and disposal of all hazardous material, including petroleum products related to construction activities and equipment. Include the HMCP as an appendix to the SWPPP. Compile Material Safety Data Sheets in one location and reference that location in the HMCP.

Designate a Contractor's Spill Response Field Representative with 24 hour contact information. Designate a Subcontractor Spill Response Coordinator for each subcontractor. The Superintendent and Contractor's Spill Response Field Representative must have 24 hour contact information for each Subcontractor Spill Response Coordinator and the Utility Spill Response Coordinator.

List and give the location and estimated quantities of hazardous materials (Including materials or substances listed in 40 CFR 117 and 302, and petroleum products) to be used or stored on the Project. Hazardous materials must be stored in covered storage areas. Include secondary containment for all hazardous material storage areas.

Identify the locations where fueling and maintenance activities will take place, describe the activities, and list controls to prevent the accidental spillage of petroleum products and other hazardous materials. Controls include placing absorbent pads or other suitable containment under fill ports while fueling, under equipment during maintenance or repairs, and under leaky equipment.

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). Spill response materials must be stored in sufficient quantity at each work location, appropriate to the hazards associated with that site.

Describe procedures for containment and cleanup of hazardous materials. Describe a plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by spills. Describe a plan for dealing with contaminated soil and water encountered during construction. Clean up spills or contaminated surfaces immediately.

Describe methods of disposing of waste petroleum products and other hazardous materials generated by the Project, including routine maintenance. Identify haul methods and final disposal areas. Assure final disposal areas are permitted for hazardous material disposal.

Describe methods of complying with the requirements of AS 46.04.010-900, Oil and Hazardous Substances Pollution Control, and 18 AAC 75. Include contact information for reporting hazardous materials and petroleum product spills to the Project Engineer and reporting to federal, state and local agencies.

157-2.3 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC Plan) REQUIREMENTS.

Prepare and implement an SPCC Plan when required by 40 CFR 112; when both of the following conditions are present on the Project:

- a. Oil or petroleum products from a spill may reach navigable waters (as defined in 40 CFR 112); and
- b. Total above ground storage capacity for oil and any petroleum products is greater than 1,320 gallons (not including onboard tanks for fuel or hydraulic fluid used primarily to power the movement of a motor vehicle or ancillary onboard oil-filled operational equipment, and not including containers with a storage capacity of less than 55 gallons)

Reference the SPCC Plan in the HMCP and SWPPP.

157-2.4 RESPONSIBILITY AND AUTHORITY OF THE SUPERINTENDENT AND SWPPP MANAGER.

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, Inspection Reports, 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 submitted under Subsection 157-1.3.a, Inspection Reports, and other reports required by the CGP.

The Superintendent may assign certain duties to the SWPPP Manager. Those duties may include:

- a. Ensuring Contractor's and subcontractor's compliance with the SWPPP and CGP;
- b. Ensuring the control of erosion, sedimentation, or discharge of pollutants;
- c. Directing and overseeing installation, maintenance, and removal of BMPs;
- d. Performing Inspections; and
- e. Updating the SWPPP including adding amendments and forms.

When Bid Item P-157g is part of the Contract, the SWPPP Manager must be available at all times to administer SWPPP requirements, and be physically present within the Project Zone or the project office, for at least eight hours per day when construction activities are occurring.

The Superintendent and SWPPP Manager shall be knowledgeable in the requirements of this Item P-157, the SWPPP, CGP, BMPs, HMCP, SPCC Plan, environmental permits, environmental commitments, and historic preservation commitments.

The Superintendent and SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP or CGP.

157-2.5 MATERIALS.

Use materials suitable to withstand hydraulic, wind, and soil forces, and to control erosion and trap sediments according to the requirements of the CGP and the Specifications.

Use the temporary seed mixture specified by special provision, or use annual rye grass if no temporary seed mix is specified.

Use soil stabilization material as specified in Item P-.682 or the BMP details attached to the SWPPP, and T-908

Use silt fences as specified in P-680.

Use 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.

Use Oregon Scientific RGR126 wireless rain gauge with temperature, or Taylor 2751 Digital Wireless Rain Gauge with Thermometer, or approved equivalent

157-2.6 CONTRACTOR REQUIREMENTS.

The Contractor must be familiar with the conditions and requirements of the CGP because Contractor's employees will be conducting duties that relate to compliance with the CGP.

157-3.1 CONSTRUCTION REQUIREMENTS.

Comply with the SWPPP and the requirements of the CGP Part 5.0.

a. Before Construction Activity may Begin.

Complete all of the following before Construction Activities begins, except winter construction activity (CGP Part 4.2.4.2) may begin after completing (1) through (3).

- (1)** SWPPP Preparer visit the Project site, document the visit in the SWPPP Form 25D-106), and develop the SWPPP (or amended) with findings from the visit;
- (2)** Get approval of the SWPPP from the Engineer Form 25D-109;
- (3)** Get authorization from the Engineer to begin;
- (4)** The Project eNOIs for the Owner and for the Contractor, as well as any other eNOIs if there are additional operators, are listed as Active Status on the DEC website;
- (5)** Submit (when required) the CBJ approved SWPPP to DEC and Local Government;
- (6)** Transmit to the Engineer an electronic copy of the approved SWPPP.
- (7)** Delegation of Authority Form (25D-108 and 25D-107) for both the Contractor and CBJ Engineer are signed.
- (8)** Post notices. Include the following information:
 - (a)** Copy of all eNOIs related to this project;

(b) Location of the SWPPP.

Post notices on the outside wall of the Contractor's project office, and near the main entrances of the construction project. Protect postings from the weather. Locate postings so the public can safely read them without obstructing construction activities or the traveling public (for example, at an existing pullout). Do not use retroreflective signs for the SWPPP posting. Do not locate SWPPP signs in locations where the signs may be confused with traffic control signs or devices. Update the notices if the listed information changes.

(9) Install an outdoor rain gauge per manufacturer's guidance in a readily accessible location on the Project. Projects may utilize the nearest National Weather Service (NWS) precipitation gauge station, if within 20 miles of the project, to determine rainfall amounts during storm events.

(10) Delineate the site for both land disturbing activities and areas that will be left undisturbed.

(11) Install perimeter controls, sediment controls, and other BMPs that must be placed prior to the initiation of Construction Activity.

b. During Construction.

Before subcontractors or utility companies begin soil disturbing activities, provide to them copies of applicable portions of the SWPPP, and require them to sign a SWPPP Subcontractor Certification, Form 25D-105. Include SWPPP Subcontractor Certifications as an appendix to the SWPPP. Ensure subcontractors and utility companies understand and comply with the SWPPP and the CGP. Inform subcontractors and utility companies of SWPPP amendments that affect them in a timely manner. Coordinate with subcontractors and utility companies doing work in the Project Zone so BMPs, including temporary and permanent stabilization are installed, maintained, and protected from damage.

Provide on-going training to employees and subcontractors, on control measures at the site and applicable storm water pollution prevention procedures. Training must be specific to the installation, maintenance, protection, and removal of control measures CGP 4.14. Training must be given at a frequency that will be adequate to ensure proper implementation and protection of control measures, and no less frequently than once a month during construction activity. Document on the SWPPP Training Log, Form 25D-125, the dates and attendees to these trainings. Include the SWPPP Training Log as an appendix to the SWPPP.

Notify the Engineer immediately if the actions of any utility company or subcontractor do not comply with the SWPPP and the CGP.

Comply with Subsection GCP-70-11 Protection and Restoration of Property and Landscape. Concrete washout must be fully contained.

Comply with CGP Part 4.8.2 for fueling and maintenance activities. Place absorbent pads or other suitable containment under fill ports while fueling, under equipment during maintenance or repairs, and under leaky equipment.

Comply with requirements of the HMCP and SPCC Plan, and all local, state and federal regulations that pertain to the handling, storage, containment, cleanup, and disposal of petroleum products or other hazardous materials.

Keep the SWPPP and HMCP current (refer to Subsection 157-2.1.c, SWPPP Considerations and Contents)

c. Pollutant and Hazardous Materials Reporting Requirements.

If there has been an incident of non-compliance with the CGP that may endanger health or the environment, immediately report the incident to the Engineer and the Regional Stormwater Specialist, who will determine if reporting to the DEC is required according to the CGP, Appendix A, Part 3.0. Notify the Engineer immediately and, to the extent possible, coordinate reports to DEC with the Engineer. The report will be made by the Regional Stormwater Specialist and must include:

- (1) A description of the noncompliance and its causes;
 - (2) The exact dates and times of noncompliance ;
 - (3) If not yet corrected the anticipated time the project will be brought back into compliance; and
 - (4) The corrective action taken or planned to reduce, eliminate and prevent reoccurrence.
- Notify the Engineer immediately if there is an incident of non-compliance with USACE Permits.

Report spills of petroleum products or other hazardous materials to the Engineer and other agencies as required by law. Use the HMCP and SPCC Plan (if available) for contact information to report spills to regulatory agencies.

d. Corrective Action and Maintenance of BMPs.

Implement maintenance as required by the CGP, SWPPP, and manufacturer's specifications, whichever is more restrictive.

- (1) Implement corrective action:
 - (a) If an incident of non-compliance with the SWPPP, or CGP is identified;
 - (b) If an Inspection or the Engineer identifies the SWPPP or any part of the SWPPP is ineffective in preventing erosion, sedimentation or the discharge of pollutants;
 - (c) If a required BMP was not installed according to the SWPPP schedule or phasing, or was installed incorrectly, or was not installed according to the CGP Part 4.0;
 - (d) If a BMP is not operating as intended, has not been maintained in an effective operation condition, or is unable to effectively perform the intended function;
 - (e) If a prohibited discharge of pollutants, as specified in CGP Part 4.7, is occurring or will occur; or
 - (f) If there is accumulation of sediment or other pollutants, that is in or near any storm water conveyance channels, or that may enter a discharge point or storm sewer system. If there is accumulation of sediment or other pollutants that is being tracked outside the project zone.
- (2) Implement corrective actions so that they comply with the following time requirement:
 - (a) For conditions that are easily remedied (i.e. removal of tracked sediment, maintenance of control measure, or spill clean-up), initiate corrective action within 24 hours and complete as soon as possible;

- (b) If installation of a new control measure is needed or an existing control measure requires redesign and reconstruction or replacement to make it operational, the corrective action must be completed within seven calendar days from the time discovered.
- (c) For all other conditions initiate corrective actions so both of the following requirements are met:
 - 1. Corrective action is completed in time to protect water quality; and
 - 2. Corrective action is completed no later than the Complete-by-Date that was entered in an Inspection Report (see Subsection 157-3.3.b for more information).

If a corrective action is not implemented within the time requirements of this section, document the situation in the SWPPP, notify the Engineer and implement corrective action as soon as possible.

If a corrective action could affect a subcontractor, notify the subcontractor within three days of taking the corrective action. Require in your written subcontract, that subcontractors must notify the Contractor within 24 hours of becoming aware of a condition that requires a corrective action.

e. Stabilization.

Stabilization may be accomplished using temporary or permanent measures. Initiate stabilization of disturbed soils, erodible stockpiles, disposal sites, and of erodible aggregate layers so that all of the following conditions are satisfied:

- (1) Immediately;
- (2) As soon as necessary to avoid erosion, sedimentation, or the discharge of pollutants; and
- (3) As identified in the SWPPP.

Land may be disturbed and stabilized multiple times during a project. Coordinate work to minimize the amount of disturbed soil at any one time. Do not disturb more soil than you can stabilize with the resources available.

Temporarily stabilize from wind and water erosion portions of disturbed soils, portions of stockpiles, and portions of disposal sites, that are not in active construction. Temporary stabilization measures may require 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.

When temporary or permanent seeding is required, provide a working hydro seeding equipment located within 100 miles of the project by road; with 1,000 gallon or more tank capacity, paddle agitation of tank, and the capability to reach the seed areas with an uniform mixture of water, seed, mulch and tackifier. If the project is located in an isolated community the hydro-seeder must be located at the project.

Before applying temporary or permanent seeding, prepare the surface to be seeded to reduce erosion potential and to facilitate germination and growth of vegetative cover. Apply seed and maintain seeded areas. Reseed areas where growth of temporary vegetative cover is inadequate to stabilize disturbed ground.

Apply permanent seed according to Item T-901 within the time periods allowed by the contract, at locations where seeding is indicated on the plans and after land-disturbing activity is permanently ceased.

When installing a culvert or other drainage structure where stream bypass is not used, install temporary or permanent stabilization concurrently or immediately after placing the culvert or drainage structure in a manner that complies with the SWPPP, applicable project permits and prevents discharge of pollutants. Install temporary and permanent stabilization:

- (1) At the culvert or drainage structure inlet and outlet; and
- (2) In the areas upstream and downstream that may be disturbed by the process of installing the culvert, culvert end walls, culvert end sections, or drainage structure.

Before deactivating a stream bypass or stream diversion used for construction of a bridge, culvert, or drainage structure, install permanent stabilization:

- (1) At the inlet and outlet of the culvert, drainage structure, or bridge;
- (2) 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; and
- (3) Under the bridge.

Within seven (7) days of initiating final stabilization, either complete final stabilization or continue maintenance of work until final stabilization is complete.

f. Ending CGP Coverage and BMP Maintenance.

The Engineer will determine the date that all the following conditions for ending CGP coverage have been met within the Project Zone:

- (1) Land disturbing activities have ceased;
- (2) Final Stabilization has been achieved on all portions of the Project Zone, in accordance with CGP Part 4.5.2 (including at CBJ furnished material sources, disposal sites, staging areas, equipment areas, etc.); and
- (3) Temporary BMPs have been removed.

After the Engineer has determined the conditions for ending CGP coverage have been met, the Owner will:

- (1) Send written notice to the Contractor with the date that the conditions were met;
- (2) Submit an NOT to DEC; and
- (3) Provide a copy of the NOT and DEC's acknowledgement letter to the Contractor.

The Contractor is responsible for ending permit coverage within the Project Zone, by submitting an NOT to DEC within 30 days of meeting the conditions for ending CGP coverage. The Contractor is responsible for BMP maintenance and SWPPP updates until permit coverage is ended.

If the Contractor's CGP eNOI acreage includes Support Activities and any other areas where the Owner is not an Operator, the Contractor may not be able to file an NOT at the same time as the Owner. In this case, the Contractor must amend the SWPPP and separate SWPPP2(s), to indicate the Owner's CGP coverage has ended, and the Owner is no longer an Operator within the Project Zone.

The Contractor must indicate in the SWPPP the areas that have reached Final Stabilization, and the dates land disturbing activities ended and Final Stabilization was achieved. The Contractor must submit an NOT to DEC, and insert copies of the Owner's and the Contractor's NOTs with DEC's acknowledgement letters in the appendix of the SWPPP.

The Contractor must submit a copy of each signed NOT and DEC's acknowledgement letter to the Owner within three days of filing the NOT or receiving a written response.

The Contractor is responsible for coordinating local government inspections of work and ending permit coverage with local government. See Subsection 157-1.3.e for more information.

g. Transmit final SWPPP.

Transmit one copy of the final SWPPP, including all amendments, appendices and maps, to the Engineer; when the project NOTs are filed, or within 30 days of the Owner's NOT being filed, whichever is sooner. Transmittal must be by both electronic and hard copy.

157-3.2 SWPPP DOCUMENTS, LOCATION ON-SITE, AVAILABILITY, AND RECORD RETENTION.

The SWPPP and related documents maintained by the Contractor are the Record for demonstrating compliance with the CGP. Copies of SWPPP documents transmitted to the Engineer under the requirements of this specification are informational and do not relieve the Contractor's responsibility to maintain complete records as required by the CGP and this specification.

Keep the SWPPP, HMCP and SPCC Plan at the on-site project office. If there is not an on-site project office, keep the documents at a locally available location that meets CGP requirements and is approved by the Engineer. Records may be moved to another office for record retention after the NOTs are filed. Records may be moved to another office during winter shutdown. Update on-site postings if records are relocated during winter shutdown. Provide the CBJ with copies of all Records.

Retain Records and a copy of the SWPPP, for at least three years after the date of NOT. If EPA or DEC inspects the project, issues a Notice of Violation (NOV), or begins investigation for a potential NOV before the retention period expires, retain the SWPPP and all Records related to the SWPPP and CGP until at least three years after EPA and/or DEC has determined all issues related to the investigation are settled.

The SWPPP and related documents must be made available for review and copy, to the CBJ and other regulatory agencies that request them. See CGP Parts 5.10, 6.6 and 9.5.

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. Update SWPPP Corrective Action Log Form 25D-112, SWPPP Amendment Log Form 25D-114, SWPPP Grading and Stabilization Activities Log Form 25D-110, Staff Tracking Log Form 25D-127, and SWPPP Daily Record of Rainfall Form 25D-115.

a. Inspection during Construction.

Conduct Inspections according to the schedule and requirements of the SWPPP and CGP.

Inspections required by the CGP and SWPPP must be performed by the Contractor's SWPPP Manager and the CBJ's Stormwater Inspector jointly, unless impracticable. For this paragraph, "impracticable" means when both inspectors must fly to a remote area in the winter or when one inspector is sick or unable to travel to the site due to weather. When this is the case, the

Operator who conducts the Inspection must provide a copy of the Inspection Report to the other Operator within three days of the Inspection date and document the date of the report transmittal.

b. Inspection Reports.

Use only the CBJ SWPPP Construction Site Inspection Report, Form 25D-100 to record Inspections. Changes or revisions to Form 25D-100 are not permitted; except for adding or deleting data fields that list: Location of Discharge Points and Site Specific BMPs. Complete all fields included on the Inspection Report form; do not leave any field blank.

Insert a Complete-by-Date for each corrective action listed that complies with:

(1) Section 157-3.1 (d); and

(2) The CGP

Provide a copy of the completed, unsigned Inspection Report to the Engineer by the end of the next business day following the inspection.

The Superintendent must review, correct errors, and sign and certify the Inspection Report, within three days of the date of Inspection. The Engineer may coordinate with the Superintendent to review and correct any errors or omissions before the Superintendent signs the report. Corrections are limited to adding missing information or correcting entries to match field notes and conditions present at the time the Inspection was performed. Deliver the signed and certified Inspection Report to the Engineer on the same day the Superintendent signs it.

The Engineer will sign and certify the Inspection Report and will return the original to the Contractor within three working days.

The Engineer may make corrections after the Superintendent has signed and certified the Inspection Report. The Engineer will initial and date each correction. If the Engineer makes corrections, the Superintendent must recertify the Inspection Report by entering a new signature and date in the white space below the original signature and date lines. Send a copy of the recertified Inspection Report to the Engineer on the day it is recertified.

If subsequent corrections to the certified Inspection Report are needed, document the corrections in an amendment that addresses only the omitted or erroneous portions of the original Inspection Report. The Superintendent and the Engineer must both sign and certify the amendment.

c. Seasonal Suspension of Work.

Construction Activities within the Project Zone must be stabilized with appropriate BMPs prior to fall freeze-up

Conduct an Inspection before seasonal suspension of work to confirm BMPs are installed and functioning according to the requirements of the SWPPP and the CGP. Also ensure that stabilization is in place for the anticipated spring thaw.

When work is suspended due to fall freeze-up (CGP Part 4.12, Winter Considerations), the Engineer may suspend inspection requirements fourteen days after anticipated fall freeze-up if:

(1) Soil disturbing activities are suspended; and

(2) Soil stabilizing activities are suspended.

Inspections must resume according to the normal inspection schedule identified in the SWPPP, at least 21 days before anticipated spring thaw per CGP Part 6.2.3.

The Engineer may waive requirements for updating the Grading and Stabilization Activities Log and Daily Record of Rainfall during seasonal suspension of work. If so, resume collecting and recording weather data on the Daily Record of Rainfall from one month before thawing conditions are expected to result in runoff. Resume recording land disturbance and stabilization activities on the Grading and Stabilization Activities Log when Construction Activity resumes.

d. Reduced Inspection Frequencies.

Conduct inspections according to the inspection schedule indicated in the approved SWPPP. Any change in inspection frequency must be approved by the Engineer, and beginning and ending dates documented as an amendment to the SWPPP.

Inspection frequency may be reduced to at least one inspection every month, if approved by the Engineer and the entire site is temporarily stabilized.

e. Inspection before Project Completion.

Conduct Inspection to ensure Final Stabilization is complete throughout the Project, and temporary BMPs that are required to be removed are removed. Temporary BMPs that are biodegradable and are specifically designed and installed with the intent of remaining in place until they degrade, may remain in place after project completion with the Engineer's approval.

f. Items and Areas to Inspect.

Conduct Inspections of the areas required by the CGP and SWPPP.

g. SWPPP Amendments and SWPPP Amendment Log.

The Superintendent and the SWPPP Manager are the only persons authorized to amend the SWPPP and update the SWPPP Amendment Log, Form 25D-114. The Superintendent or the SWPPP Manager must sign and date amendments to the SWPPP and updates to the SWPPP Amendment Log.

SWPPP Amendments must be approved by the Engineer.

Amendments must occur:

- (1) Whenever there is a change in design, construction operation, or maintenance at the construction site that has or could cause erosion, sedimentation or the discharge of pollutants that has not been previously addressed in the SWPPP;
- (2) If an Inspection identifies that any portion of the SWPPP is ineffective in preventing erosion, sedimentation, or the discharge of pollutants;
- (3) Whenever an Inspection identifies a problem that requires additional or modified BMPs
- (4) Whenever a BMP is modified during construction, or a BMP not shown in the original SWPPP is added;
- (5) If the Inspection frequency is modified (note beginning and ending dates); or

(6) When there is a change in personnel who are named in the SWPPP, according to Subsection 157-2.1.d.

Amend the SWPPP narrative as soon as practicable after any change or modification, but in no case, later than seven days following identification of the need for an amendment. Every SWPPP Amendment must be signed and dated. Cross-reference the amendment number with the Corrective Action Log or SWPPP page number, as applicable. When a BMP is modified or added, describe the BMP according to Subsection 157-2.1.c.

Keep the SWPPP Amendment Log current. Prior to performing each scheduled Inspection, submit to the Engineer a copy of the pages of the Amendment Log that contain new entries since the last submittal. Include copies of any documents amending the SWPPP.

Keep the SWPPP Amendment Log as an appendix to the SWPPP.

h. Site Maps.

Document installation, routine maintenance, and removal of BMPs by making notes on the SWPPP Site Maps. Include the date and the recording person's initials by these notes. Identify any Public Water Systems (PWS) and drinking water protection areas (DWPA) per CGP Part 4.10. Identify areas where Construction Activities which cause soil disturbance begin, areas where Construction Activities which cause soil disturbance temporarily or permanently cease, and areas that are temporarily or permanently stabilized.

i. Corrective Action Log.

The Superintendent and SWPPP Manager are the only persons authorized to make entries on the SWPPP Corrective Action Log, Form 25D-112. Document the need for corrective action within 24 hours of either:

- (1) Identification during an inspection; or
- (2) Discovery by the CBJ's or Contractor's staff, a subcontractor, or a regulatory agency inspector.

Modification or replacement of a BMP, installation of a new BMP not shown in the original SWPPP, routine maintenance, or overdue maintenance is a corrective action and must be documented on the Corrective Action Log. Maintenance is considered overdue under any of the following conditions:

- (1) Accumulated sediment in sediment basins, including sediment traps and ponds, exceeds 50% of design capacity.
- (2) Sediment accumulates to more than a third of the above ground height of silt fence protecting water bodies.
- (3) Sediment accumulates to more than half of the above ground height of storm water inlets, check dams, berms, or silt fence not protecting water bodies.

Within 24 hours of discovery, update the Corrective Action Log, Form 25D-112, with the date of discovery and proposed corrective action. If discovered during an inspection, update log with inspection date and proposed corrective actions noted on the Inspection Report. If discovered outside of an inspection, update the log with the date of discovery, the proposed corrective action, and the date the corrective action was completed..

After the corrective action has been accomplished, note in the Corrective Action Log the action taken and if a SWPPP amendment was needed. 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.

j. Grading and Stabilization Activities Log.

The Superintendent and SWPPP Manager are the only persons authorized to date and initial entries on the SWPPP Grading and Stabilization Activities Log, Form 25D-110. Use the SWPPP Grading and Stabilization Activities Log, to record land disturbance and stabilization activities.

Keep the Grading and Stabilization Activities Log current and submit a copy to the Engineer prior to performing each scheduled SWPPP Inspection. Keep the Grading and Stabilization Activities Log organized and completed to demonstrate compliance with the CGP Part 4.5.

Keep the Grading and Stabilization Activities Log as an appendix to the SWPPP.

k. Daily Record of Rainfall.

Use 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 Inspection. Keep the Daily Record of Rainfall as an appendix to the SWPPP.

l. Staff Tracking Log.

Use the SWPPP Staff Tracking Log, Form 25D-127, to keep staff records current. Include records of the AK-CESCL or equivalent qualifications for the Superintendent, SWPPP Manager, ATS operator, any acting Superintendent and acting SWPPP Managers, and beginning and end dates for temporary personnel assignments related to administration of the CGP or Section P-157. Update the SWPPP Staff Tracking Log within 24 hours of any changes in personnel, qualifications, or other staffing items related to administration of the CGP or Section P-157.

157-3.4 FAILURE TO PERFORM WORK.

The Engineer has authority to suspend work and withhold monies, for an incident of non-compliance with the CGP or SWPPP, that may endanger health or the environment or for failure to perform work related to Section P-157.

a. Non-compliance.

(1) **Incidents of Non-compliance.** Failure to:

- (a) Obtain appropriate permits before Construction Activities occur;
- (b) Perform SWPPP Administration;
- (c) Perform timely Inspections;
- (d) Update the SWPPP;

- (e) Transmit updated SWPPP, Inspection Reports, and other updated SWPPP forms to the Engineer;
 - (f) Maintain effective BMPs to control erosion, sedimentation, and pollution in accordance with the SWPPP, the CGP, and applicable local, state, and federal requirements;
 - (g) Perform duties according to the requirements of Section P-157;
 - (h) Meet requirements of the CGP, SWPPP, or other permits, laws, and regulations related to erosion, sediment, or pollution control; and
- (2) **Notice of non-compliance**, either oral or written will include:
- (a) Reason/defects
 - (b) Corrective actions required
 - (c) Time allowed for completing the corrective action
- (3) **Levels of Non-compliance and Response** correspond with harm to the workers, the public or the environment and whether the harm is:
- (a) **Not-imminent**, the Engineer will either orally or in writing, or both, provide notice to the Contractor indicating the incident of non-compliance. Contractor's that take corrective action and complete the action to the satisfaction of the Engineer, within the time specified, may return to the status of compliance, and avoid elevating the response to imminent.
 - (b) **Imminent**, the Engineer will orally provide notice to the Contractor of non-compliance and promptly provide written notice to suspend work until corrective action is completed. No additional Contract time or additional compensation will be allowed due to delays caused by the Engineer's suspension of work.
 - (c) Additional actions, taken against the Contract whether the level of non-compliance is Not-imminent or Imminent, may include:
 - Withholding monies until corrective action is completed
 - Assessing damages or equitable adjustments
 - Employing others to perform the corrective action and deduct the cost

157-3.5 ACCESS TO WORK.

The Project, including any related off-site areas or support activities, must be made available for inspection, or sampling and monitoring, by the CBJ and other regulatory agencies. See CGP Part 6.6.

157-4.1 METHOD OF MEASUREMENT. Section 90, P-157-5.1, and as follows:

Items P-157a, P-157c and P-157g, are lump sum.

Items P-157b, P-157d and P-157e, will be measured on a contingent sum basis as specified by the Directive authorizing the work.

Item P-157f will be measured on a contingent sum basis with withholding determined by the Owner.

TABLE 157-1 BMP VALUES - RESERVED

Liquidated Damages assessed according to Table 157-2 are not an adjustment to the Contract amount. These damages charges are related to Contract performance but are billed by the CBJ, independent of the Contract amount. An amount equal to the Liquidated Damages may be withheld for unsatisfactory performance, from payment due under the Contract, until the Contractor remits payment for billed Liquidated Damages.

**TABLE 157-2- Version B
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES**

Code	Specification Section Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
a	157-1.4 Failure to have a qualified (AK-CESCL or equivalent) SWPPP Manager	Calculated in Code B or F	
b	Failure to meet SWPPP requirements of: (1) 157-2.1.a Name of SWPPP Preparer (2) Not Applicable (3) 157-3.3.h Sign and Date SWPPP amendments with qualified person (4) 157-2.1.d SWPPP Include approving person's name and AK-CESCL expiration date (5) 157-3.2 Records maintained at project and made available for review	\$750 per omission	
c	Not Applicable		
d	157-3.3.e Failure to stabilize a Project prior to fall freeze up.	\$5,000 per Project per year	
e	157-2.1.a Failure to conduct pre-construction inspections before Construction Activities on all projects greater than 1 acre.	\$2,000 per Project	
f*	157-3.3. Failure to conduct and record CGP Inspections 157-3.3.a Personnel conducting Inspections and Frequency 157-3.3.b Inspection Reports, use Form 25D-100, completed with all required information	\$750 per Inspection	Additional \$750 for every additional 7 day period without completing the required inspection.
g	157-3.1.d Failure to timely accomplish BMP maintenance and/or repairs. In effect until BMP maintenance and/or repairs is completed.	\$500 per Project per day	

Code	Specification Section Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
h	157-3.1.c Failure to provide to the Engineer and DEC a timely oral noncompliance report of violations or for a deficient oral noncompliance report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period with- out the required information
i	157-3.1.c Failure to provide to the Engineer and DEC a timely written noncompliance report, use Form 25D-143, of violations or for a deficient written endangerment report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information
j	157.3.4 Failure to comply with the requirements of the CGP, approved SWPPP, or Item P-157, except as listed above	\$750 per occurrence for the first day	Additional \$750 for every day the deficiency remains uncorrected

Code f* Liquidated Damages will not be billed for typographic errors and minor data entry errors except the liquidated damages will be billed for these errors when:

- the contractor has previously been notified and subsequent inspection reports repeat the same or similar error;
- multiple inspection reports are submitted after the submission due date and the same or similar errors are repeated on multiple overdue reports; or
- an error in recording the inspector's AK-CESCL certification date results in an inspector performing the inspection during a period when their certification was lapse or was otherwise invalid.

157-5.1 BASIS OF PAYMENT. See Subsection 157-3.4 Failure to Perform Work, for additional work and payment requirements.

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, SWPPP and HMCP and SPCC Plan preparation, agency fees for SWPPP reviews, SWPPP amendments, pre-construction Inspections, Inspections, monitoring, reporting, and Record keeping or copying Records related to the SWPPP and required by the CGP, and Record retention.

Item P-157b Temporary Erosion, Sediment and Pollution Control. At the contingent sum prices specified for all labor, supervision, material, equipment, and incidentals to install, maintain, remove and dispose of approved temporary erosion, sedimentation, and pollution control BMPs required to implement the SWPPP and SPCC Plan.

Item P-157c Temporary Erosion, Sediment and Pollution Control. At the Contract lump sum price for all labor, supervision, material, equipment, and incidentals to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs identified in the SWPPP and SPCC Plan.

Item P-157d Temporary Erosion Sediment and Pollution Control Additives. At the contingent sum prices specified in the Directive to authorize the work, for all labor, supervision, materials, equipment, and incidentals for extra, additional, or unanticipated work, to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs not covered by Item P-157c. All additional

Erosion, Sediment, and Pollution Control Administration necessary due to this item will not be paid for separately but will be subsidiary to other bid items.

Item P-157e Temporary Erosion Sediment and Pollution Control by Directive. At the contingent sum prices specified in the Directive using time and materials to authorize the work, for all labor, supervision, materials, equipment, and incidentals to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs. Prices for this item will be by time and materials according to Subsection GCP-90-05, or by mutual agreement between the Engineer and Contractor. All additional Erosion, Sediment, and Pollution Control Administration necessary due to this item will not be paid for separately but will be subsidiary to other bid items.

Item P-157f Withholding. The Engineer may withhold an amount equal to Liquidated Damages, assessed according to Item P-157, from payment due the Contractor. Liquidated Damages for violations of the Contract, CWA, CGP, are determined by the Engineer according to Table 157-2. The Engineer may withhold payment due the Contractors until the Contractor pays the Liquidated Damages to the CBJ.

The CBJ will not release performance bonds until Liquidated Damages assessed according to Item P-157 are paid to the CBJ, and all requirements according to Subsection GCP-30-05 are satisfied.

Item P-157g SWPPP Manager. At the Contract lump sum price for a SWPPP Manager that conforms to this specification. When Item P-157g appears in the Bid Schedule, the SWPPP Manager must be a different person than the superintendent, and must be physically present during construction activity with duties and authority as described in Subsection 157-2.4. When Item P-157g does not appear in the Bid Schedule, the SWPPP Manager is subsidiary to Item P-157a.

Subsidiary Items. Temporary erosion, sediment and pollution control measures that are required outside the Project Zone are subsidiary. Work required by the HMCP and SPCC Plan including hazardous material storage, containment, removal, cleanup and disposal, are subsidiary to Item P-157a Erosion, Sediment and Pollution Control Administration.

Work under other pay items. Work that is paid for directly or indirectly under other pay items will not be measured and paid for under Section 157. This work includes but is not limited to:

- a. Dewatering;
- b. Shoring;
- c. Bailing;
- d. Permanent seeding;
- e. Installation and removal of temporary work pads;
- f. Temporary accesses;
- g. Temporary drainage pipes and structures;
- h. Diversion channels;
- i. Settling impoundment; and
- j. Filtration.

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

Work at the Contractor's Expense. Temporary erosion, sediment and pollution control measures that are required due to carelessness, negligence, or failure to install temporary or permanent controls as scheduled or ordered by the Engineer, or for the Contractor's convenience, are at the Contractor's expense.

Payment will be made under:

PAY ITEM		PAY UNIT
P-157a(1)	Erosion, Sediment and Pollution Control Administration	Lump Sum
P-157a(2)	Erosion, Sediment and Pollution Control Administration	Lump Sum
P-157a(3)	Erosion, Sediment and Pollution Control Administration	Lump Sum
P-157a(4)	Erosion, Sediment and Pollution Control Administration	Lump Sum
P-157a(5)	Erosion, Sediment and Pollution Control Administration	Lump Sum
P-157c(1)	Temporary Erosion, Sediment and Pollution Control	Lump Sum
P-157c(2)	Temporary Erosion, Sediment and Pollution Control	Lump Sum
P-157c(3)	Temporary Erosion, Sediment and Pollution Control	Lump Sum
P-157c(4)	Temporary Erosion, Sediment and Pollution Control	Lump Sum
P-157c(5)	Temporary Erosion, Sediment and Pollution Control	Lump Sum
P-157e(1)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
P-157e(2)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
P-157e(3)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
P-157e(4)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
P-157e(5)	Temporary Erosion, Sediment and Pollution Control by Directive	Contingent Sum
P-157f(1)	Withholding	Contingent Sum
P-157f(2)	Withholding	Contingent Sum
P-157f(3)	Withholding	Contingent Sum
P-157f(4)	Withholding	Contingent Sum
P-157f(5)	Withholding	Contingent Sum

ITEM P-160 EXCAVATION OF PAVEMENT

DESCRIPTION

160-1.1 Excavate, haul, and dispose of existing asphalt cement concrete (AC) pavement and portland cement concrete (PCC) pavement.

CONSTRUCTION REQUIREMENTS

160-2.1 Perform the work for this item according to the following instructions.

- a. Excavation.** Excavate to the minimum depth necessary for removal of existing pavement where shown on the Plans. Saw cut where shown on the Plans.
- b. Disposal.** Excavated pavement material becomes the property of the Contractor. Remove excavated material to an approved disposal site off of airport property in accordance with applicable Federal and State regulations.
- c. Drainage.** Maintain drainage at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the prosecution or condition of the work.

METHOD OF MEASUREMENT

160-3.1 Section 90. Where portland cement concrete pavement is overlain by asphalt concrete pavement, the asphalt concrete pavement will not be measured separately and will be considered portland cement concrete pavement for payment purposes.

BASIS OF PAYMENT

160-4.1 At the contract unit price for excavation and disposal of pavement materials for either AC or PCC pavement.

Payment will be made under:

Item P-160a Excavation of Pavement – per square yard

ITEM P-161 RECYCLED ASPHALT PAVEMENT

DESCRIPTION

161-1.1 Excavate and or process existing asphalt cement concrete (AC) pavement for use as Recycled Asphalt Pavement (RAP). Haul and place RAP on a prepared foundation, to the lines, grades, and depths shown on the plans or as directed by the Engineer. The Contractor may use the RAP stockpile located in the NWDA, processing will be required.

MATERIAL AND CONSTRUCTION REQUIREMENTS

161-2.1 PROCESSING. Crush or pulverize existing pavement to meet the requirements of Table 161-1 for use as Recycled Asphalt Pavement (RAP). Process RAP to provide an asphalt content of 2.5 – 5.5 percent by weight.

Saw cut and process the full depth of existing pavement in areas shown on the plans or as directed by the Engineer. Excavate to the minimum depth necessary for removal of all existing pavement. Up to one inch of underlying base course material may be excavated along with the AC pavement.

TABLE 161-1

RAP GRADATION REQUIREMENTS

Sieve Size	Percent Passing
2 in.	100
1 in.	90-100

161-2.2 PLACEMENT AND SPREADING. Place RAP in 4-inch thick maximum lifts on the approved surface as required to achieve the depth shown on the plans after compaction.

Excess RAP is the property of the State. Place excess RAP in stockpiles located and shaped as shown on the plans, or as directed by the Engineer.

161-2.3 COMPACTION. Thoroughly compact the RAP layer by rolling. Density acceptance will be based on the use of a control strip in accordance with ATM 412 to determine a density standard. Compact to a density not less than 98% of the density standard. After rolling and with the RAP thoroughly set, reduce interstitial spaces to a minimum. Blade and roll alternately as required or directed to obtain a smooth, even and uniformly compacted surface. Do not roll the RAP course when the underlying course is soft or yielding or when the rolling causes undulation of the surface. In areas inaccessible to rollers, tamp RAP material thoroughly with hand held mechanical tampers.

161-2.4 RAP PROTECTION. Do not perform work on the RAP course during freezing temperatures, when the subgrade is wet, or when rain is expected. Hauling equipment may be routed over the finished RAP course, provided no damage results and provided that equipment is routed over the full width of the RAP surface to avoid rutting or uneven compaction. The Engineer has authority to stop all hauling over completed or partially completed RAP when, in his opinion, such hauling is causing damage. Repair at your expense, any damage to the RAP course resulting from the routing of equipment over RAP surfaces.

161-2.5 PROTECTION OF EXISTING STRUCTURES. Take all precautions necessary to ensure that existing structures within pavement removal areas are not damaged. If damage to any structure occurs, repair the damage at no cost to the Owner.

161-2.6 DRAINAGE. Maintain drainage at all times. Install temporary drains and drainage ditches, when directed, to intercept or divert surface water that may affect the prosecution or condition of the work.

METHOD OF MEASUREMENT

161-3.1 Section 90. If RAP by unit area appears in the bid schedule, the item will be measured in original position before excavation. If RAP by unit volume appears in the bid schedule, the item will be measured in final position after processing and placement. Underlying base course material excavated along with the AC pavement will not be included in the measurement for payment of RAP measured by unit volume.

BASIS OF PAYMENT

161-4.1 At the contract unit price for recycled asphalt pavement accepted in place.

Payment will be made under:

Item P-161e Recycled Asphalt Pavement Placement – per cubic yard

TESTING REQUIREMENTS

ATM 412 Relative Standard Density by the Control Strip Method

ITEM P-165 REMOVAL OF STRUCTURES

DESCRIPTION

165-1.1 Remove and dispose of, abandon in place, or salvage existing structures as specified. as shown on the Plans, and as necessary to accomplish the project work elements. Backfill the resulting holes abandoned structures, and pits in accordance with this Item.

MATERIALS

165-2.1 GENERAL. Sand slurry shall consist of a mixture of water and sand with an approximate ratio of seven (7) gallons of water per cubic foot of sand. Sand may consist of native material with a particle size distribution such that one hundred percent (100%) of the material passes the No. 4 U.S. Standard Sieve and contains no lumps, frozen material, organic matter, or other deleterious material.

CONSTRUCTION REQUIREMENTS

165-2.1 GENERAL. Obtain utility locates in the vicinity of the designated items. Work around and preserve any facilities within the work limits. Backfill all excavations with approved embankment or suitable excavated materials and compact in accordance with item P-152. Fill all abandoned in place structures with sand slurry.

- a. **Removed Structures Designated for Disposal.** Removed structures designated for disposal become your property. Excavate, load, and haul structures to an approved disposal site off of airport property in accordance with applicable Federal and State regulations. *[List specific structures designated for disposal.]*

Before demolition or renovation of a contaminated structure a survey shall be done which complies with the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61 Subpart M.

Obtain qualified consultant services to develop and implement a plan to identify hazardous materials and to oversee and conduct removal of Hazardous Materials from the building as needed. Submit five copies of the building removal plan to the Engineer for approval.

Pre approve the qualified consultant with the Engineer by submitting their qualifications. The qualified consultant must be approved by the Environmental Protection Agency (EPA) as a building inspector, 40 CFR Part 763.

All Hazardous Materials must be disposed of in an approved site.

Removed Structures Designated for Salvage. Removed structures designated for salvage remain the property of the CBJ. All removed signs shall be delivered to Airport Maintenance.

See summary table in the Plans for a list of structure designated for salvage.

- b. **Abandoned In Place Structures.** Wherever an existing structure is to be abandoned in place, The Contractor shall empty the structure of all water, fill the structure full with sand slurry, and plug the ends. Placement of the sand slurry shall be by means of a tremie pipe or other method that shall enable uniform placement of the sand slurry throughout the length of the structure being abandoned. The Contractor shall demonstrate the entire structure to be abandoned has been filled prior to the installation of end caps. Validation shall include placement of a predetermined volume of sand slurry into the structure to be abandoned.

In the event a pipeline to be abandoned is cracked or crushed, the Contractor shall excavate to the next joint of pipe and install the plug. Crushed pipe sections or portions thereof shall be removed and disposed of by the Contractor.

METHOD OF MEASUREMENT

165-3.1 This item will not be measured for payment. The Engineer's acceptance constitutes measurement.

BASIS OF PAYMENT

165-4.1 Payment will be made at the contract price for work acceptably completed. No separate payment will be made for hauling or transportation. All work associated with removal of specified items, including but not limited to labor, equipment, tools, hauling, transportation, and incidentals will be included in the contract price for removal of structures.

Payment will be made under:

Item P-165a Removal of Structures - per lump sum

ITEM P-209 CRUSHED AGGREGATE BASE COURSE

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregates constructed on a prepared course according to these Specifications and to the dimensions and typical cross section shown on the Plans.

MATERIALS

209-2.1 CRUSHED AGGREGATE BASE. Crushed aggregates shall consist of clean, sound, durable particles of crushed stone or crushed gravel and shall be free from organic matter, excess coatings of clay, silt, and other objectionable materials and shall contain no clay lumps balls.

Fine aggregate passing the No. 4 sieve shall consist of fines from the crushing operation. If necessary, fine aggregate may be added to produce the correct gradation. The fine aggregate shall be produced by crushing stone and gravel that meet the coarse aggregate requirements for wear and soundness.

The crushed aggregate portion which is retained on the No. 4 sieve shall have at least 70% by weight with 2 fractured faces as determined by ATM 305.

The percentage of wear shall not be greater than 50% when tested according to AASHTO T 96. The sodium sulfate soundness loss shall not exceed 9%, after 5 cycles, when tested according to AASHTO T 104. Aggregates shall have a minimum degradation value of 45 when tested according to ATM 313.

The fraction passing the No. 40 sieve shall have a liquid limit no greater than 25 and a plasticity index of not more than 6 when tested according ATM 204 and ATM 205.

- a. **Sampling and Testing.** The Engineer will sample aggregates for quality testing before the start of production. The Engineer, at no expense to the Contractor, will make all tests necessary to determine whether aggregate quality is in compliance with the specifications.

The Engineer will sample aggregates for acceptance according to ATM 301, and test aggregates for acceptance according to ATM 304.

- b. **Gradation Requirements.** The gradation of the final mixture shall fall within the range indicated in Table 1, when tested according to ATM 304. The final gradation shall be continuously well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa.

TABLE 1. REQUIREMENTS FOR GRADATION OF AGGREGATE

Sieve Designation (Square Openings)	Percentage by weight passing sieves	
	C-1	D-1
1-1/2 in	100	--
1.00 in	70-100	100
3/4 in	60-90	70-100
3/8 in	45-75	50-80
No.4	30-60	35-65
No. 8	22-52	20-50
No. 50	8-30	8-30
No. 200	0-6	0-6

Note: Unless otherwise specified, Gradation D-1 shall be used.

CONSTRUCTION METHODS

209-3.1 PREPARING UNDERLYING COURSE. Placing and spreading operations shall not commence until the underlying course has been accepted, in writing, by the Engineer. Any ruts or soft areas shall be corrected and compacted to the required density before placing the base course. Crushed aggregate base course shall not be placed on frozen material.

209-3.2 MIXING. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.4, the approved material may be transported directly to the spreading equipment. The plant shall blend and mix the materials to meet the Specifications.

209-3.3 PLACING. The crushed aggregate base material shall be placed on the approved subgrade in uniform, equal-depth layers, each not exceeding 6 inches of compacted depth.

The previously constructed layer shall be cleaned of loose and foreign material prior to placing the next layer. The surface of the compacted material shall be kept moist until covered with the next layer.

209-3.4 COMPACTION. Immediately upon completion of the spreading operations, the aggregate shall be thoroughly compacted to the required density. \pm 2 percentage points of the optimum moisture content.

209-3.5 ACCEPTANCE SAMPLING AND TESTING FOR DENSITY. Base course will be accepted for density when the field density is not less than 98% of the maximum density, as determined according to ATM 207 or ATM 212, or ATM 309. The control strip for ATM 309 shall be compacted by a vibratory compactor with a minimum operating weight of 22,000 pounds.. The in-place field density and moisture content will be determined according to ATM 213. If the specified density is not attained, the material shall be reworked and/or recompacted until the specified density is reached.

209-3.6 FINISHING. The surface of the aggregate base 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 base 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.

209-3.7 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 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.

209-3.8 THICKNESS CONTROL. The thickness of the finished base course will be determined by the Engineer by taking before and after elevation measurements, or by depth tests, at random locations. The completed thickness of the base course shall be within 1/2 inch of the design thickness. Where the thickness is deficient by more than 1/2 inch, it shall be corrected to within the specified tolerances.

209-3.9 MAINTENANCE. The base course shall be maintained in a condition that will meet all specification requirements until the work is accepted. Equipment used in the construction of an adjoining section may be routed over completed portions of the base course, provided no damage results and provided that the equipment is routed over the full width of the base course to avoid rutting or uneven compaction.

209-3.10 2-INCH MINUS SHOT ROCK WITH BASE COURSE. The 2-inch minus shot rock shall be graded to a uniform surface and compacted with a vibratory roller per these Specifications and the Plans. The finished shot rock surface layer shall be approved by the Engineer prior to placing the Grading D-1 base course top layer.

2-Inch Minus Shot Rock will be placed and compacted into a layer 4- inches to 5-inches thick, and covered with Base Course, to a total thickness of 6-inches for the area between curb lines. The thickness of these materials under the sidewalk shall be 2-inches to 3-inches of 2-Inch Minus Shot Rock and covered with Base Course to a total thickness of 4-inches. Both of these materials will be measured for payment under this Pay Item. 2-Inch Minus Shot Rock shall meet the requirements previously stated.

The crushed aggregate base material shall be placed on the approved subgrade in uniform, equal-depth layers, each not exceeding 6 inches of compacted depth.

The previously constructed layer shall be cleaned of loose and foreign material prior to placing the next layer. The surface of the compacted material shall be kept moist until covered with the next layer.

If base course, Grading D-1, is used as a leveling course for the curb and gutter, all of this base course material shall be removed from the 2-inch minus shot rock to the front face of the concrete gutter, and the additional 2-inch minus shot rock required to bring the street area to its required full depth be placed, graded and compacted prior to placing the top layer of base course, Grading D-1.

METHOD OF MEASUREMENT

209-4.1 Crushed Aggregate Base Course will be weighed by the ton or measured by the cubic yard in final position according to Subsection GCP-90-02.

Water needed for compaction and added to the base material on the grade will be considered incidental.

BASIS OF PAYMENT

209-5.1 Crushed Aggregate Base Course will be paid for at the contract price, per unit of measurement, accepted in place.

Payment will be made under:

Item P-209b Crushed Aggregate Base Course - per ton

TESTING REQUIREMENTS

ATM 212	Determining the Standard Density of Coarse Granular Materials Using the Vibratory Compactor
ATM 313	Degradation Value of Aggregates
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 301	Sampling Aggregates
ATM 304	Sieve Analysis of Aggregates & Soils
ATM 204	Liquid Limit of Soils
ATM 205	Plastic Limit and Plasticity Index of Soils

ATM 207	Moisture-Density Relationship of Soils
ATM 307	Sand Equivalent
ATM 213	In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods
ATM 305	Percentage of Fracture in Coarse Aggregate

ITEM P-401 PLANT HOT MIX ASPHALT PAVEMENT

DESCRIPTION

401-1.1 This item shall consist of a surface course composed of mineral aggregate and asphalt cement mixed in a central mixing plant and placed on a prepared course according to these Specifications and shall conform to the lines, grades, thicknesses, and typical cross sections shown on the Plans. Each course shall be constructed to the depth, typical section, or elevation required by the Plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 AGGREGATE. Aggregates shall consist of crushed stone or crushed gravel with or without sand or other inert finely divided mineral aggregate. The portion of materials retained on the No. 4 sieve is coarse aggregate. The portion passing the No. 4 sieve and retained on the No. 200 sieve is fine aggregate, and the portion passing the No. 200 sieve is mineral filler. Remove all natural fine aggregates passing the No. 4 sieve before crushing aggregates for hot mix asphalt. Separate the crushed aggregate into a minimum of three stockpiles, blend mineral filler or natural sand if necessary to produce the Job Mix Design gradation for hot mix asphalt.

- a. **Coarse Aggregate.** Coarse aggregate shall consist of sound, tough, durable particles, free from adherent films of matter that would prevent thorough coating and bonding with the bituminous material and be free from organic matter and other deleterious substances. The percentage of wear shall not be greater than 40% when tested according to AASHTO T 96. The sodium sulfate soundness loss shall not exceed 10%, or the magnesium sulfate soundness loss shall not exceed 13%, after 5 cycles, when tested according to AASHTO T 104. The aggregate shall have a minimum degradation value of 30 when tested according to ATM 313.

The crushed aggregate portion which is retained on the No. 4 sieve shall have at least 90% by weight 2 fractured faces as determined by ATM 305.

The aggregate shall not contain more than 8%, by weight, of flat or elongated pieces, when tested according to ATM 306. The ratio of the calipers shall be set to 1:5.

The blended coarse aggregate for hot mix asphalt, Type V, shall have at least 98% by weight 2 fractured faces as determined by WAQTC FOP for AASHTO T 335 and contain not more than 8% and 20%, by weight, of flat and elongated particles with the ratio of the calipers set to 1:5 and 1:3 respectively as determined by ATM 306.

- b. **Fine Aggregate.** Fine aggregate shall consist of clean, sound, durable, angular shaped particles produced by crushing stone, slag, or gravel that meets the requirements for wear and soundness specified for coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. The fine aggregate, including any blended material for the fine aggregate, shall have a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested according to ATM 204 and ATM 205.

Natural (nonmanufactured) sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this specification. The fine aggregate shall not contain more than 20% natural sand by weight of total aggregates. The fine aggregate for hot mix asphalt, Type V, shall not contain more 10% natural sand by weight of total aggregates.

The aggregate shall have sand equivalent values of 35 or greater when tested according to ATM 307.

- c. **Sampling.** The Engineer will sample according to ATM 301 for coarse and fine aggregate and according to AASHTO T 127 for mineral filler.

401-2.2 MINERAL FILLER. If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of AASHTO M 17.

401-2.3 ASPHALT CEMENT. Asphalt cement shall conform to the following property requirements:

TABLE 1. ASPHALT CEMENT PROPERTY REQUIREMENTS

Performance Grade AASHTO M 320	MIX DESIGN CLASS	Softening Point AASHTO T 53	Toughness ASTM D5801	Tenacity ASTM D5801
PG 52-28	A, B	N/A	N/A	N/A
PG 58-28		120° F, min.	110 in lbs, min.	75 in lbs, min.
PG 64-34	E, F, S	125° F, min.	110 in lbs, min.	75 in lbs, min.

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

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

401-2.4 PRELIMINARY MATERIAL ACCEPTANCE. Prior to delivery of materials to the job site, the Contractor shall submit certified test reports to the Engineer for the following materials:

a. Coarse Aggregate.

- (1) Percent of wear.
- (2) Soundness.
- (3) Degradation
- (4) Percent of fracture
- (5) Percent of flat and elongated particles

b. Fine Aggregate.

- (1) Liquid limit.
- (2) Plastic index.
- (3) Sand equivalent.
- (4) Uncompacted void content for hot mix asphalt, Type V.

c. Mineral Filler.

- d. **Asphalt Cement.** The certification(s) shall show the appropriate test(s) for each material, the test results, and a statement that the material meets the specification requirement.

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

COMPOSITION

401-3.1 COMPOSITION OF MIXTURE. The plant mix shall be composed of a mixture of well-graded aggregate, filler if required, and asphalt cement. The several aggregate fractions shall be sized, handled

in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 JOB MIX FORMULA. No Pavement removal/cold planning may proceed and no hot mix asphalt for payment shall be produced until a JMF has been approved by the Engineer. The hot mix asphalt shall be designed using procedures contained in ATM 417, "Chapter 5, Marshall Method of Mix Design, of the Asphalt Institute's Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete", and shall meet the requirements of Tables 1 and 2.

The hot mix asphalt, Type V, shall be designed using procedures contained in AASHTO R-35 and shall meet the requirements of Table 4. Upon completion of the JMD, determine the Marshall stability and Marshall air voids at the design asphalt cement content using a 75-Blow Marshall from procedures contained in ATM 417. If material variability exceeds the standard deviations indicated, the JMF and subsequent production targets should be based on a stability greater than shown in Table 2, and the flow and air voids should be targeted close to the mid-range of the criteria in order to meet the acceptance requirements.

If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ATM 414, is less than 75, the aggregates shall be rejected or the asphalt treated with an approved anti-stripping agent. The amount of anti-stripping agent added to the asphalt shall be sufficient to produce a TSR of not less than 75. If an antistrip agent is required, it will be provided by the Contractor at no additional cost.

The JMF shall be submitted in writing by the Contractor to the Engineer at least 15 calendar days prior to the start of paving operations and shall include as a minimum:

- a. Percent passing each sieve size.
- b. Percent of asphalt cement.
- c. Asphalt viscosity or penetration grade.
- d. Number of blows of hammer compaction per side of molded specimen.
- e. Mixing temperature.
- f. Compaction temperature.
- g. Temperature of mix when discharged from the mixer.
- h. Temperature-viscosity relationship of the asphalt cement.
- i. Plot of the combined gradation on the Federal Highway Administration (FHWA) 45 power gradation curve.
- j. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content.
- k. Percent natural sand.
- l. Percent fractured faces.
- m. Percent elongated particles.
- n. Tensile Strength Ratio (TSR).
- o. Antistrip agent (if required).

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

The JMF may be designed by the Owner. The Contractor shall submit material samples to the Engineer, upon request, for JMF design. The Owner will furnish one JMD, that meets specifications, for each Type and Class of HMA specified. If additional JMDs are required, the Engineer will assess a fee of \$2,500.00 under Contract Item P-401b, Hot Mix Asphalt Price Adjustment, for each additional JMD furnished.

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

TABLE 2. MIX DESIGN REQUIREMENTS

Test Property	Class A, C, E Pavements Designed for Aircraft Gross Weights of 60,000 Lbs. or More or Tire Pressures of 100 Psi or More	Class B, D, F Pavements Designed for Aircraft Gross Weight Less Than 60,000 Lbs. or Tire Pressure Less Than 100 Psi
Number of blows	75	50
Stability, pounds	2150	1350
Flow, 0.01 inch	10-14	10-18
Air voids %	2.8-4.2	2.8-4.2
Voids in mineral aggregate, %, min.	See Table 3	See Table 3
Asphalt Cement Content, %, min. @ 4% Air voids	5.0	5.0

TABLE 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Maximum Particle Size Inch	Voids in Mineral Aggregate, %, Minimum
1/2	14.0
3/4	13.0
1	12.0

TABLE 4 HOT MIX ASPHALT TYPE V MIX DESIGN REQUIREMENTS

Mix Design Class S Pavements for gross aircraft weights of 60,000 pounds or more.	
Test Property	Design Criteria ¾" Nominal Maximum Aggregate Size
Initial Number of Gyration (N _{ini})	8
Design Number of Gyration (N _{des})	75
Maximum Number of Gyration (N _{max})	130
Air voids @ N _{des}	4
Voids in Mineral Aggregate @ N _{des} , %	13.0 min.
Voids filled with Asphalt @ N _{des} , %	65-78
Dust to effective asphalt ratio	0.6 -1.2
Uncompacted Void Content	45 min
% G _{mm} @ N _{ini}	≤ 90.50
% G _{mm} @ N _{max}	≤ 98.00
Asphalt Cement Content, %, min. @ 4.0% VTM	5.0
Marshall Stability 75 blow (average of 3 specimens)	Report
Marshall Air Voids – 75 blow (average of 3 specimens)	Report
Rut Index, Max., ATM 419	3

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory screens, will conform to the gradation or gradations specified in Table 5 when tested according to ATM 304.

The gradations in Table 5 represent the limits which shall determine the suitability of aggregate for use from the sources of supply. The aggregate, as selected (and used in the JMF), shall have a gradation

within the limits designated in Table 5 and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine when tested according to ATM 304.

For acceptance testing, deviations from the final approved mix design for bitumen content and gradation of aggregates shall be within the tolerance limits for individual measurements as specified in Table 7. The limits still will apply if they fall outside the master grading band in Table 4. Limits do not apply to the largest sieve specified.

The maximum size aggregate used shall not be more than one-half of the thickness of the course being constructed.

TABLE 5 . AGGREGATE – HOT MIX ASPHALT PAVEMENTS

Sieve Size	Percentage by Weight Passing Sieves			
	Type I 1.00 inch max	Type II 0.75 inch max	Type III 0.50 inch max	Type V 0.75 inch max
1 in.	100	--	--	--
3/4 in.	80-90	100	--	100
1/2 in.	60-84	75-90	100	65-90
3/8 in.	48-78	60-84	80-90	55-80
No. 4	28-63	33-70	44-81	40-60
No. 8	14-55	19-56	26-70	≤45
No.16	9-44	10-44	16-59	≤ 35
No.30	6-34	7-34	9-49	≤ 25
No.50	5-24	5-24	6-36	≤ 20
No.100	4-16	4-16	4-22	≤ 12
No.200	3-8	3-8	3-8	3-8

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute Manual Series No. 2 (MS-2), Appendix A.

401-3.3 RECYCLED ASPHALT CONCRETE. Recycled asphalt concrete shall consist of reclaimed asphalt pavement (RAP), coarse aggregate, fine aggregate, mineral filler, asphalt cement, and recycling agent, if necessary. Reclaimed asphalt pavement may be used for all courses. Except the top lift of HMA pavement

The RAP shall be of a consistent gradation and asphalt content. The Contractor may obtain the RAP from the job site or an existing source.

All new aggregates used in the recycled mix shall meet the requirements of Subsection 401-2.1. New bituminous material shall meet the requirements of Subsection 401-2.3. Recycling agents shall meet the requirements of AASHTO R 14.

The recycled asphalt concrete mix shall be designed using procedures contained in the Asphalt Institute's Manual Series Number 20 (MS-20), Asphalt Hot-Mix Recycling, in conjunction with MS-2 and ATM 417. The job mix shall meet the requirements of Subsection 401-3.2. In addition to the requirements of Subsection 401-3.2, the JMF shall indicate the percent of RAP, the percent and viscosity grade of new asphalt, the percent and grade of hot-mix recycling agent (if used), and the properties (including viscosity and penetration) of the asphalt blend. The amount of RAP shall be limited to 30 percent, as long as the resulting recycled mix meets all requirements that are specified for virgin mixes (mixes containing no RAP).

The Contractor shall submit documentation to the Engineer, indicating that the mixing equipment proposed for use is adequate to mix the percent of RAP shown in the JMF and meet all local and national environmental regulations.

401-3.4 TEST SECTION. Prior to any existing pavement removal, cold planning, and full production, the Contractor shall prepare and place a quantity of hot mix asphalt according to the JMF. The amount of mixture should be sufficient to construct a test section 300 feet long and at least 20 to 30 feet wide placed in two lanes, with a longitudinal cold joint, and shall be of the same depth specified for the construction of the course which it represents. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

Three random 6 inch diameter core samples, randomly selected according to ASTM D3665, shall be cut from the finished pavement mat by the Contractor. The samples will be tested for density from the bulk specific gravity (BSG) according to ATM 410 and evaluated according to Section 401-5.2. The Target Value for density will be 94.0% of the theoretical maximum specific gravity (MSG), as determined by ATM 409. The sample used to determine the theoretical MSG will be randomly selected from the material in the test section. The relative density in percent equals the BSG times 100 divided by the maximum specific gravity for the lot and rounded to the nearest tenth of a percent.

Three random samples of the mixture will be taken according to 401-5.1a(1) and (2) and tested for aggregate gradation and asphalt cement content according to Section 401-5.1 and evaluated according to Section 401-5.2. Joint density will be evaluated according to Subsection 401-5.2f(3). The Target Value for joint density shall be 92.0% of the theoretical MSG as determined by ATM 409.

If the initial test section should prove to be unacceptable, the necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made. A second test section shall then be placed. If the second test section also does not meet specification requirements, both sections shall be removed at the Contractor's expense. Additional test sections, as required, shall be constructed and evaluated for conformance to the Specifications. Any additional sections that are not acceptable shall be removed at the Contractor's expense. Full production shall not begin until an acceptable section has been constructed and accepted by the Engineer. The initial test section, whether acceptable or unacceptable, and any subsequent section that meets specification requirements will be paid for according to Subsection 401-8.1.

Job mix control testing shall be performed by the Contractor at the start of plant production and in conjunction with the calibration of the plant for the JMF. It should be recognized that the aggregates produced by the plant may not satisfy the gradation requirements or produce a mix that exactly meets the JMF. In those instances, it will be necessary to reevaluate and redesign the mix using plant-produced aggregates. Specimens should be prepared and the optimum bitumen content determined in the same manner as for the original design tests.

401-3.5 TESTING LABORATORY. The laboratory used to develop the JMF shall meet the requirements of ASTM D3666. A certification signed by the manager of the laboratory stating that it meets these requirements shall be submitted to the Engineer prior to the start of construction. The certification shall contain as a minimum:

- a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.
- b. A listing of equipment to be used in developing the job mix.
- c. A copy of the laboratory's quality control system.
- d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program

401-3.6 PRE_PAVING CONFERENCE. At least 48 hours prior to beginning paving, the Contractor shall schedule a pre-paving conference with the Engineer. As a minimum the following items shall be addressed in a work plan at the conference:

- a. Construction Safety and Phasing Plan procedures to be implemented prior to and during paving.
- b. Paving plan including production rate, longitudinal joint layout and sequencing of operations.
- c. Number and capacity of trucks, cycle time and delivery rate.
- d. Haul route of trucks.
- e. Number, type, weight and operating speed of rollers.
- f. Brand and model of paver.

CONSTRUCTION METHODS

401-4.1 WEATHER LIMITATIONS. The bituminous mixture shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 6 . The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

TABLE 6. BASE TEMPERATURE LIMITATIONS

Mat Thickness	Base Temperature (Minimum)
Greater than 1 inch	40 °F
1 inch or less	50 °F

401-4.2 ASPHALT MIXING PLANT. Plants may not be placed on Airport property. Plants used for the preparation of hot mix asphalt shall conform to the requirements of AASHTO M 156 with the following changes:

Requirements for All Plants.

- a. **Truck Scales.** The hot mix asphalt shall be weighed on approved scales furnished by the Contractor, or on certified public scales at the Contractor's expense. Scales shall be inspected and sealed as often as the Engineer deems necessary to assure their accuracy. Scales shall conform to the requirements of Item G-130-2.5.
- b. **Testing Facilities.** The Contractor shall provide laboratory facilities at the plant or job site for the Contractor's quality control testing, according to Subsection 401-6.2.
- c. **Inspection of Plant.** The Engineer, or Engineer's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.
- d. **Storage Bins and Surge Bins.** Paragraph 4.9 of ASTM D995 is deleted. Instead, the following applies. Use of surge bins or storage bins for temporary storage of hot mix asphalt will be permitted as follows:

- (1) The hot mix asphalt may be stored in surge bins for not longer than 3 hours.
- (2) The hot mix asphalt may be stored in insulated storage bins for not longer than 8 hours.

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

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

401-4.3 HAULING EQUIPMENT. Trucks used for hauling hot mix asphalt shall have tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated

with a minimum amount of paraffin oil, lime solution, or other approved material. Each truck shall have a suitable cover to protect the mixture from heat loss and adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened. Applying diesel fuel to truck beds or gates will not be allowed.

401-4.4 HOT MIX ASPHALT PAVERS. Hot mix asphalt pavers shall be self-propelled, with an activated screed, heated as necessary, and shall be capable spreading and finishing courses of bituminous plant mix material which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

The HMA paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1%.

The controls shall be capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet in length.
- b. Taut stringline (wire) set to grade.
- c. Short ski or shoe.
- d. Laser control.

401-4.5 ROLLERS. Rollers of the vibratory, steel wheel, and pneumatic-tired type shall be used. They shall be in good condition, capable of operating at slow speeds to avoid displacement of the hot mix asphalt. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition.

The use of equipment which causes excessive crushing of the aggregate will not be permitted.

401-4.6 PREPARATION OF ASPHALT CEMENT. The asphalt cement shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt cement to the mixer at a uniform temperature. The temperature of the asphalt cement delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325 °F.

401-4.7 PREPARATION OF MINERAL AGGREGATE. The aggregate for the mixture shall be heated and dried prior to introduction into the mixer. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350 °F when the asphalt is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability. Dry the aggregate so the moisture content of the hot mix does not exceed 0.5% by total weight of mix as determined by ATM 407.

401-4.8 PREPARATION OF HOT MIX ASPHALT. The aggregates and the asphalt cement shall be weighed or metered and introduced into the mixer in the amount specified by the JMF.

The combined materials shall be mixed until the aggregate obtains a uniform coating of bitumen and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in AASHTO T 195, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all bituminous mix upon discharge shall not exceed 0.5% of the total weight of mix, as determined by ATM 407.

401-4.9 PREPARATION OF THE UNDERLYING SURFACE. Immediately before placing the hot mix asphalt, the underlying course shall be cleaned of all dust and debris. A prime coat or tack coat shall be applied according to Item P-602 or P-603, if required by the contract Specifications.

401-4.10 TRANSPORTING, PLACING, AND FINISHING. The hot mix asphalt shall be transported from the mixing plant to the site in vehicles conforming to the requirements of Subsection 401-4.3. Deliveries shall be scheduled so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Adequate artificial lighting shall be provided for night placements. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature. The Contractor may elect to use a material transfer vehicle to deliver mix to the paver.

Upon arrival, the mixture shall be placed to the full width by a bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 20 feet except where edge lanes require less width to complete the area. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 12 inches; however, the joint in the surface top course shall be at the centerline of the pavement. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course.

The mix shall be placed and compacted at a temperature not less than 235 °F.

Transverse joints in adjacent lanes shall be offset a minimum of 10 feet.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and compacted by hand tools.

401-4.11 COMPACTION OF MIXTURE. After placing, the mixture shall be thoroughly and uniformly compacted by rolling. The surface shall be compacted as soon as possible when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened (and scrapers used), but excessive water will not be permitted.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers.

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

401-4.12 JOINTS. The formation of all joints shall be made in such a manner as to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be given a tack coat of joint adhesive before placing any fresh mixture against the joint.

All longitudinal joints that have become cold (less than 160 °F) or damaged shall be cut back 4 inches maximum with a cutter mounted on the outside of a power roller as approved by the engineer. After being cut back, the joint will be brushed with a power broom as directed by the engineer to remove all loose asphalt concrete.

To ensure a continuous bond between the longitudinal pavement joints in the top lift, a tack coat of Crafcoc Pavement Joint Adhesive No. 34524 or Deery Cold Joint Adhesive, or approved equal, shall be applied to the joint prior to the laydown of the asphalt concrete. All longitudinal joints in the final lift shall be formed in such a manner that the joint meets density requirements of this specification. Joints that are irregular, damaged, uncompacted or otherwise defective, or which have been left exposed and whose surface temperature has cooled to less than 160 degrees F shall be cut back 4 inches maximum to expose a clean, sound surface. All contact surfaces shall be cleaned and dry and given an application of joint adhesive prior to placing any fresh mixture against the joint. When forming a longitudinal joint in the final lift, apply a 1/8 inch thick band joint adhesive to the full height of the joint surface before to placing any fresh hot mix asphalt against the joint. Joint edge preparation, and joint adhesive application temperature, thickness, and method shall be per the manufacturer's recommendations.

Joint sealant shall be applied in a 12-inch wide strip centered over joints in the final lift layer of hot mix asphalt while the asphalt is still clean, free of moisture, and before striping, when required according to Subsection 401-5.2.f.(2). Joint sealant shall be applied over joints in the final lift formed by two panels of hot mix asphalt composed of different type or class of mix; or of new against existing hot mix asphalt pavement. Joint surface preparation, joint sealant application temperature, thickness, and method shall be per the manufacturer's recommendations with a 1 inch max overlap on the bottom surface.

All costs associated with joint preparation, applying joint sealant, and applying joint adhesive are subsidiary to the hot mix asphalt pay item.

MATERIAL ACCEPTANCE

401-5.1 ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Engineer at no cost to the Contractor. Testing organizations performing these tests will meet the requirements of ASTM D3666.

Asphalt Lots. The quantity of each type of asphalt concrete mixture produced and placed will be divided into lots and the lots evaluated individually for acceptance. The Owner has the exclusive right and responsibility for determining the acceptability of all materials incorporated into the project. The results of the acceptance testing performed by the Engineer will be made available to the Contractor.

5,000 ton lot size. A lot will normally be 5,000 tons. The lot will be divided into 10 equal sublots of 500 tons, each randomly sampled and tested for asphalt cement content, density and gradation according to this subsection.

If the project has more than 1 lot and if less than 8 sublots have been sampled at the time a lot is terminated, the material in the shortened lot will be included as part of the prior lot and the price adjustment computed for the prior lot will include the samples from the shortened lot.

1,500 to 4,999 ton lot size. If the total project quantity is between 1,500 tons and 4,999 tons, the total project quantity will be considered one lot. The lot will be divided into sublots of 500 tons and randomly sampled for asphalt cement content, density and gradation according to this subsection except a determination for outliers will not be performed. The lot will be evaluated for price adjustment according to Subsection 401-5.2 except as noted.

Under 1,500 ton lot size. If the total project quantity is less than 1,500 tons, or for approaches, pathways, and temporary pavement, asphalt concrete pavement will be accepted for payment based on the Engineer's approval of a Job Mix Formula and the placement and compaction of the asphalt concrete pavement to the specified depth and finished surface requirements and tolerances, and material testing. The Engineer reserves the right to perform any testing required in order to determine acceptance.

Any area of finished surfacing that is segregated, fails to meet surface tolerance requirements, cools to below 170 °F prior to completing compaction, or is any other way defective shall be removed and replaced with new asphalt concrete pavement. Removal and replacement of defective pavement shall be at no additional cost to the Owner.

Joint lot size. The lot size for longitudinal joint density in the final lift of asphalt concrete pavement will be the total length of longitudinal joints constructed by a lot of material for the mat completing the joint.

a. Sampling.

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

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

- (2) Gradation.** Samples taken for the determination of aggregate gradation will be either of the following as directed by the Engineer, randomly according to the procedures contained in ATM 301. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. The samples will be taken from one of the following locations:

(a) The same as specified for the determination of asphalt cement content.

(b) From the combined aggregate cold feed conveyor via a diversion chute or from the stopped conveyor belt. On drum mix plants a diverter device for obtaining aggregate samples shall be located on the conveyor system delivering combined aggregates into the drum. The diverter device shall divert aggregate from the full width of the conveyor system and shall be maintained to provide a representative sample of aggregate incorporated in the mix. The plant shall be equipped with a safe and suitable location for obtaining aggregate samples from the diverter device.

(c) Dry batched aggregates.

Density. The Contractor shall cut full depth core samples from each the finished HMA, within 24 hours of final rolling for density acceptance testing. Neatly cut one 6-inch-diameter core sample with a core drill at each location marked by the Engineer. Use a core extractor to prevent damage to the core. Backfill and compact voids left by coring with new HMA within 24 hours. Densities will not be measured at milled edge of existing pavement. Failure to cut core samples or backfill the holes left by sampling within the specified period will result in a deduction of \$100.00 per sample/hole per day. The accrued amount will be subtracted under Item P-401b, Hot Mix Asphalt Price Adjustment. Cores for mat density shall not be taken closer than 1 foot from a transverse or longitudinal joint.

Core samples for longitudinal joint density shall be centered on the intersection at the top surface of the two new hot mix asphalt panels, at the same station where the panel completing the joint is cored for mat density acceptance testing. Cores shall be taken by the Contractor in the presence of the Engineer. The Engineer will take immediate possession of the samples.

b. Testing.

- (1) **Cement Content.** Asphalt cement content will be determined by ATM 405 or ATM 406, by total weight of mix.
- (2) **Gradation.** Cold feed or dry batched aggregate gradations will be tested according to ATM 304 and evaluated for acceptance according to Subsection 401-5.2. Asphalt concrete mix and core sample gradations will be determined according to ATM 408 from extracted aggregate, or aggregate remaining after the ignition oven ATM 406 has burned off the asphalt cement.
- (3) **Density.** The Target Value for mat density shall be 95% of the theoretical MSG for all mixes except Type V, Class S which will have a target value of 96% of the MSG as determined by ATM 409. For the first lot of asphalt concrete pavement, the MSG will be determined by the Job Mix Formula. For additional lots, the MSG will be determined from the randomly selected sample from the first subplot. For joint density lots, the MSG will be MSG of the adjacent mat lot completing the joint. The Target Value for longitudinal joint density in the final lift shall be 92% of the theoretical MSG as determined by ATM 409.

Core samples will be tested according to ATM 410, and evaluated for acceptance according to Subsection 401-5.2.

401-5.2 ACCEPTANCE CRITERIA.

- a. General.** Acceptance will be based on the following characteristics of the hot mix asphalt and completed pavement as well as the implementation of the Contractor's Quality Control plan and test results:

- (1) Aggregate gradation
- (2) Asphalt content
- (3) Mat density
- (4) Joint density
- (5) Thickness
- (6) Smoothness
- (7) Grade

Aggregate gradation, asphalt content, mat density, and joint density will be evaluated for acceptance on a lot basis using the method of estimating percentage of material within specification limits (PWL). Acceptance using PWL considers the variability (standard deviation) of the material and the testing procedures, as well as the average (mean) value of the test results to

calculate the percentage of material that is above the lower specification tolerance limit (L) or below the upper specification tolerance limit (U).

Thickness will be evaluated by the Engineer for compliance according to Subsection 401-5.2.f(4). Acceptance for smoothness will be based on the criteria contained in Subsection 401-5.2f(5). Acceptance for grade will be based on the criteria contained in Subsection 401-5.2f(6).

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

- b. **Aggregate Gradation, Asphalt Content.** Evaluation for acceptance of each lot of plant-produced material for aggregate gradation and asphalt content will be based on PWL.
- c. **Mat Density.** Evaluation for acceptance of each lot of in-place pavement for mat density will be based on PWL.
- d. **Joint Density.** Evaluation for acceptance of each lot of in-place pavement for joint density will be based on PWL.
- e. **Percentage of Material Within Specification Limits (PWL).** The PWL will be determined according to procedures specified in Section 110 of the General Provisions. The sample average (X) is rounded to the nearest tenth for density and all sieves except the No. 200, and to the nearest hundredth for asphalt cement content and the No. 200 sieve. The sample standard deviation (Sn) is rounded to the nearest hundredth for density and all sieve sizes except the No. 200 sieve. The sample standard deviation (Sn) is rounded to the nearest .001 for asphalt content and the No. 200 sieve. The specification tolerance limits (L) and (U) are contained in Table 7.
- f. **Acceptance Criteria.**
 - (1) **Mat Density, Aggregate Gradation, and Asphalt Content.** Acceptance and payment for the lot will be determined according to Subsection 401-8.1.
 - (2) **Longitudinal Joint Density.** Sections of longitudinal joint represented by cores with less than 91.0% density shall be surface sealed with Asphalt Systems GSB-88, or approved equal, while the hot mix asphalt is still clean, free of moisture, and before striping. Sealing shall extend the entire longitudinal joint length between joint cores that meet the specification for density. For this type of application, GSB-78 will not be considered an "approved equal." All costs associated with sealing the joints are subsidiary to the hot mix asphalt pay item. Longitudinal joint lots will be evaluated for payment according to Subsection 401-8.3.

Longitudinal joint sealing shall be per the sealant manufacturer's recommendations. The sealant application shall be at least 12 inches wide and centered on the longitudinal joint.
 - (3) **Thickness.** Thickness will be evaluated for compliance by the Engineer to the requirements shown on the Plans. Measurements of thickness will be made by the Engineer using the cores extracted from the mat for each subplot for density measurement.
 - (4) **Smoothness.** The finished surfaces of the pavement shall not vary more than 1/4 inch for the surface course. Each lot will be evaluated with a 12-foot straightedge. The lot size will be 2000 yd². Measurements will be made perpendicular and parallel to the centerline at distances not to exceed 50 feet. When more than 15% of all measurements within a lot

exceed the specified tolerance, the Contractor shall remove the deficient area and replace with new material. Sufficient material shall be removed to allow at least 1 inch of asphalt concrete to be placed. Skin patching will not be permitted. High points may be ground off.

(5) Grade. The finished surface of the pavement shall not vary from the gradeline elevations and cross sections shown on the Plans by more than 0.05 foot. The finished grade of each lot will be determined by running levels at intervals of 50 feet or less longitudinally and transversely to determine the elevation of the completed pavement. The lot size will be 2000 yd². When more than 15% of all the measurements within a lot are outside the specified tolerance, the Contractor shall remove the deficient area and replace with new material. Sufficient material shall be removed to allow at least 1 inch of asphalt concrete to be placed. Skin patching for correcting low areas will not be permitted. High points may be ground off.

g. Outliers. All individual tests for asphalt content, aggregate gradation, and mat and joint density will be checked for outliers (test criterion) according to ATM SP-7, except as noted in Subsection 401-5.1. Outliers will be discarded, and the PWL will be determined using the remaining test values.

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

If the density test result is an outlier, the density test result will not be included in the price adjustment, however, the gradation and asphalt cement content results for that sample will be included provided neither is an outlier.

**TABLE 7. LOWER SPECIFICATION TOLERANCE LIMIT (L)
AND UPPER SPECIFICATION TOLERANCE LIMIT (U)**

Measured Characteristics	L	U
3/4 in.	TV -6.0	TV +6.0
1/2 in.	TV -6.0	TV +6.0
3/8 in.	TV -6.0	TV +6.0
No. 4	TV -6.0	TV +6.0
No. 8	TV -6.0	TV +6.0
No. 16	TV -5.0	TV +5.0
No. 30	TV -4.0	TV +4.0
No. 50	TV -4.0	TV +4.0
No. 100	TV -3.0	TV +3.0
No. 200	TV -2.0	TV +2.0
Asphalt %	TV -0.4	TV +0.4
Mat Density *	92%	98%
Joint Density	91%	98%

TV (Target Value) = Job Mix Formula value for gradation and asphalt cement content

* Mat Density for Type V, Class S: change values to L=93 and U=99

401-5.3 RETESTS.

- a. **General.** Retesting of a sample of pavement, which is outside the limits specified in Table 7, will be allowed if requested by the Contractor, in writing, within 2 days of receipt of the final test of the lot. Only one retest per sample will be permitted. The Engineer will select the sample location for the retest. The original test result will be discarded and the retest result will be used in the price adjustment calculation regardless of whether the retest result gives a higher or lower pay factor.
 - (1) A redefined PWL will be calculated for the lot.
 - (2) The cost for resampling shall be borne by the Contractor.
- b. **Payment for Resampled Lots.** The redefined PWL for a lot will be used to calculate the payment for that lot according to Table 8.

401-5.4 LEVELING COURSE. Any course used for truing and leveling shall meet the requirements of Subsection 401-3.2 and 5.2b, but will not be subject to the density requirements of Subsection 401-5.2c and d. The leveling course shall be compacted with the same effort used to achieve density of the test section. The truing and leveling course shall not exceed a nominal thickness of 1-1/2 inches.

CONTRACTOR QUALITY CONTROL

401-6.1 GENERAL. The Contractor shall develop a Quality Control Program according to Section 100 of the General Provisions. The program shall address all elements which affect the quality of the pavement including, but not limited to:

a. Mix Design	f. Mixing and Transportation
b. Aggregate Grading	g. Placing and Finishing
c. Quality of Materials	h. Joints
d. Stockpile Management	i. Compaction
e. Proportioning	j. Surface smoothness

401-6.2 TESTING LABORATORY. The Contractor shall provide a fully equipped asphalt laboratory located at the plant or job site.

The effective working area of the laboratory shall be a minimum of 150 ft² with a ceiling height of not less than 7.5 feet. Lighting shall be adequate to illuminate all working areas. It shall be equipped with heating units to maintain a temperature of 70 °F ± 5 °F.

Laboratory facilities shall be kept clean and all equipment shall be maintained in proper working condition. The Engineer shall be permitted unrestricted access to inspect the Contractor's laboratory facility and witness quality control activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting test results, the incorporation of the materials into the work will be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-6.3 QUALITY CONTROL TESTING. The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to these Specifications and as set forth in the Quality Control Program. The testing program shall include, but not necessarily limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

- a. **Asphalt Content.** A minimum of 2 asphalt cement content tests shall be performed per lot according to Subsection 401-5.1b(1).
- b. **Gradation.** Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of aggregate according to ATM 408 and ATM 304. When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix or continuous mix plants, and tested according to ATM 304 using actual batch weights to determine the combined aggregate gradation of the mixture.
- c. **Moisture Content of Aggregate.** The moisture content of aggregate used for production shall be determined a minimum of once per lot according to ATM 202.
- d. **Moisture Content of Mixture.** The moisture content of the mixture shall be determined per lot according to ATM 407.
- e. **Temperatures.** Temperatures shall be checked, at least 4 times per lot, at necessary locations to determine the temperatures of the dryer, the bitumen in the storage tank, the mixture at the plant, and the mixture at the job site.
- f. **In-Place Density Monitoring.** The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density according to ATM 411.
- g. **Additional Testing.** Any additional testing that the Contractor deems necessary to control the process may be performed at the Contractor's option.
- h. **Monitoring.** The Engineer reserves the right to monitor any or all of the above testing.

401-6.4 SAMPLING. When directed by the Engineer, the Contractor shall sample and test any material which appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be according to standard procedures specified.

401-6.5 CONTROL CHARTS. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation and asphalt content.

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

- a. **Individual Measurements.** Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation and asphalt content. The control charts shall use the JMF Target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

CONTROL CHART LIMITS FOR INDIVIDUAL MEASUREMENTS

Sieve	Action Limit	Suspension Limit
3/4 in.	0%	0%
1/2 in.	+/-6%	+/-9%
3/8 in.	+/-6%	+/-9%
No. 4	+/-6%	+/-9%
No. 16	+/-5%	+/-7.5%
No. 50	+/-3%	+/-4.5%
No. 200	+/-2%	+/-3%
Asphalt Cement Content	+/-0.45%	+/-0.70%

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

**CONTROL CHART LIMITS BASED ON RANGE
(Based on n = 4)**

Sieve	Suspension Limit
1/2 in.	14%
3/8 in.	14%
No. 4	14%
No. 16	11%
No. 50	8%
No. 200	4.5%
Asphalt Cement Content	1%

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

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

METHOD OF MEASUREMENT

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

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

The method of measurement to be used will be based on one of the following procedures. The Engineer will select in writing the procedure to be used.

- a. Supplier's invoices minus waste, diversion and excess left over. This method may be used on projects where deliveries are made in sealed tankers and the plant is producing material for one

project only. Method b. will be used to compute left over. Waste and diversion will be computed in a manner to be determined by the Engineer.

- b. Volume measure (tank stickings) of actual daily uses. It is the Contractor's responsibility to notify the Engineer whenever material is to be added to the calibrated volume measure or whenever material from the volume measure is to be used for work other than that specified in this contract.
- c. Percent of asphalt cement for each subplot as determined by ATM 405 or ATM 406 multiplied by the weight represented by that subplot.

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

BASIS OF PAYMENT

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

- a. **Basis of Adjusted Payment.** The Asphalt Price Adjustment will be the sum of the price adjustments for each lot.

The lot Pay Factors for density, gradation and asphalt cement content are determined from Table 8 using Percent Within Limits (PWL) calculated from Section 110 of the General Provisions. The maximum pay factor for the largest sieve size for gradation will be 1.00. The price adjustment will be based on the Composite Pay Factor (CPF) for asphalt content and aggregate gradation or the Density Pay Factor (DPF) whichever is the lowest value. CPF and DPF is rounded to the nearest hundredth. Table 9 is used to determine the weight factor (f) for each sieve size and asphalt content.

The hot mix asphalt Composite Pay Factor (CPF) is computed for asphalt cement content and all sieves using the following formula:

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

TABLE 8. PRICE ADJUSTMENT SCHEDULE

Percentage of Material Within the Specification Limit (PWL)	Pay Factor (PF)
96-100	1.05
90-95	0.01 PWL + 0.10
75-89	0.005 PWL + 0.55
55-74	0.014 PWL - 0.12
Below 55	0*

* If the Composite Pay Factor or the Density Pay Factor falls below 0.65, the lot shall be removed and replaced. However, the Engineer may decide to allow the deficient lot to remain in place. In that case, if the Engineer and Contractor agree in writing that the lot shall not be removed, the Pay Factor for the lot shall be 0.50.

TABLE 9. WEIGHT FACTORS

Sieve Size	Type I	Type II and Type V	Type III
	Factor “ f “	Factor “ f “	Factor “ f “
1 in.	4		
¾ in.	4	4	
½ in.	4	5	4
3/8 in.	4	5	5
No. 4	4	4	5
No. 8	4	4	5
No. 16	4	4	5
No. 30	4	5	6
No. 50	4	5	6
No. 100	4	4	4
No. 200	20	20	20
Asphalt %	40	40	40

The price adjustment for each individual lot will be calculated as follows:

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

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

PAB for Hot Mix Asphalt with PG 52-28 = \$100.00
 PAB for Hot Mix Asphalt with PG 58-28 = \$100.00
 PAB for Hot Mix Asphalt with PG 64-28 = \$100.00

* Composite Pay Factor (CPF) or Density Pay Factor (DPF) whichever is lower value.

401-8.2 ASPHALT CEMENT. Payment for an accepted lot of asphalt cement will be made at the contract unit price per ton for asphalt cement.

The Engineer will adjust Contract Item P-401b for asphalt cement property according to Subsection 401-8.2.a. The Engineer will adjust Contract Item P-401b for asphalt cement content according to Subsection 401-8.1.a.

The price will be compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

- a. **Basis of Adjusted Payment for Asphalt Cement Property.** Asphalt cement property pay reduction factors for each lot will be determined from Table 10. The total asphalt cement price adjustment is the sum of the individual lot price adjustments, and will be deducted under Item P-401b, HMA Price Adjustment.

TABLE 10. ASPHALT CEMENT PROPERTY PAY REDUCTION FACTORS
(Use the single, highest pay reduction factor)

	Spec	Pay Reduction Factor (PRF)								Reject or Engr Eval
		0	0.04	0.05	0.06	0.07	0.08	0.10	0.25	
Tests On Original Binder										
Viscosity	≤3 Pa-s	≤3		>3						
Dynamic Shear	≥1.00 kPa	≥1.00		0.88-0.99				0.71-0.87	0.50-0.70	<0.50
Toughness	≥110 in-lbs	≥93.5	90.0-93.4	85.0-89.9	80.0-84.9	75.0-79.9	70.0-74.9			<70.0
Tenacity	≥75 in-lbs	≥63.8	61.0-63.7	58.0-60.9	55.0-57.9	52.0-54.9	48.0-51.9			<48.0
Tests On RTFO										
Mass Loss	≤1.00 %	≤1.00		1.001-1.092				1.093-1.184	1.185-1.276	>1.276
Dynamic Shear	≥2.20 kPa	≥2.20		1.816-2.199				1.432-1.815	1.048-1.431	<1.048
Test On PAV										
Dynamic Shear	≤5000 kPa	≤5000		5001-5289				5290-5578	5579-5867	>5867
Creep Stiffness, S	≤300 Mpa	≤300		301-338				339-388	389-450	>450
Creep Stiffness, m-value	≥0.300	≥0.300		0.287-0.299				0.274-0.286	0.261-0.273	<0.261

Asphalt Cement Property Price Adjustment for each lot = 5 x PAB x Qty X PRF (Always a deduct.)

PAB = Price Adjustment Base (See Subsection 401-8.1.a.)
 Qty = Quantity of asphalt cement represented by lot
 PRF = Pay Reduction Factor from Table 10

Asphalt Cement Appeal Procedure. Once notified of a failing test result of an asphalt cement sample, you may elect to submit a written appeal within 21 days. The appeal must be accompanied by all contractor quality control test results and a test result of your sample of this lot tested by an asphalt laboratory that is AASHTO accredited in the test procedure in question. All costs associated with this testing are subsidiary to the Hot Mix Asphalt pay item. The Engineer will review these test results and use ASTM D 3244 to determine a test value upon which to base a price reduction. If you challenge this value, then the referee sample held by the Engineer will be sent to a mutually agreed upon independent AASHTO accredited laboratory for testing. This test result will be incorporated into the ASTM D 3244 procedure to determine a test value upon which to base a price reduction. If this final value incurs a price adjustment, the results are binding and you will pay for the cost of testing the referee sample as a deduction under item P-401b Hot Mix Asphalt Price Adjustment.

401-8.3 LONGITUDINAL JOINT. The cost for all joints is subsidiary to hot mix asphalt, no payment will be made.

The Engineer will adjust Contract Item P-401b for longitudinal joint density according to Subsection 401-8.3.a.

The subsidiary cost includes furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

- a. Basis of Adjusted Payment for Longitudinal Joints. Longitudinal joint density lots in the top layer that average less than 91.0% of MSG will be assessed a price adjustment of \$3.00 per foot. The accrued amount will be deducted under Item P-401b, Hot Mix Asphalt Price Adjustment.

Longitudinal joint density lots in the top layer that average greater than 92.0% of MSG will have an incentive of \$1.00 per foot applied. The accrued amount will be added under Item P-401b, Hot Mix Asphalt Price Adjustment.

401-8.4 ASPHALT MATERIAL PRICE ADJUSTMENT. This subsection provides a price adjustment for asphalt material by: (1) additional compensation to the contractor or (2) a deduction from the contract amount. The terms “asphalt material” and “asphalt cement” are used interchangeably as they apply to the asphalt material price adjustment.

1. This provision shall apply to asphalt material meeting the criteria of Section 401-2.3, and is included in items listed in the bid schedule of Sections P-310, P-602, P-603, P-609, and P-626.
2. This provision shall only apply to cost changes in asphalt material that occur between the first Friday of the month of which the bid opening occurs and the date the asphalt material is incorporated into the project.
3. The asphalt material price adjustment will only apply when:
 - a. There is more than 500 tons of asphalt material in the bid schedule of Sections described in Item 1; and
 - b. There is more than a seven and one half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index, AAMPI, from the date of bid opening to the date the asphalt material is incorporated into the project.
4. The AAMPI is calculated bi-monthly on the first and third Friday of each month, and is in effect from the day of calculation until the next bi-monthly calculation. The AAMPI is posted on the Owner's Statewide Materials website and is calculated according to the formula posted there. Posting of new AAMPI values after the first and third Friday of each month is typically delayed one to several days. Any delay in the Owner's posting of an updated AAMPI value shall not constitute grounds for using any value other than the value in effect as described in this specification.
5. Price adjustment will be cumulative and calculated with each progress payment.

For projects where asphalt material is purchased from a commercial plant serving multiple customers, use the AAMPI in effect on the last day of the pay period to calculate price adjustment for asphalt material incorporated into the project during that pay period. For projects where the asphalt material is purchased in advance of incorporating it into the project, use the AAMPI in effect on the last day of the pay period when the asphalt material was purchased. Submit the asphalt material purchase invoice, showing the date purchased, to the Engineer to identify the pay period when the asphalt material was purchased. The Owner will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:

For an increase exceeding 7.5%, additional compensation = $[(IPP - IB) - (0.075 \times IB)] \times Q$
For a decrease exceeding 7.5%, deduction from contract = $[(IB - IPP) - (0.075 \times IB)] \times Q$

Where:

Q = Quantity of Asphalt Material incorporated into project during the pay period, in tons

IB = Index at Bid: the Bi-monthly AAMPI in effect on date of bid, in dollars per ton

IPP = Index at Pay Period: the Bi-monthly AAMPI in effect on the last day of the pay period, in dollars per ton

6. Method of measurement for determining Q (quantity) is the weight of asphalt material that meets the criteria of this subsection and is incorporated into the project. The quantity does not include aggregate, mineral filler, blotter material, thinning agents added after material qualification, or water for emulsified asphalt.

BASIS OF PAYMENT

Payment will be made under:

Item P-401a(1)	Hot Mix Asphalt Type II, Class B – per ton
Item P-401a(2)	Hot mix asphalt Type V, Class S - per ton
Item P-401b(1)	Hot Mix Asphalt Price Adjustment – per contingent sum
Item P-401b(2)	Hot Mix Asphalt Price Adjustment – per contingent sum
Item P-401c(1)	Asphalt Cement, PG 52-28 – per ton
Item P-401c(2)	Asphalt Cement PG 52-28 - per ton

TESTING REQUIREMENTS

ATM 301	Sampling Aggregates
ATM 304	Sieve Analysis of Aggregate and Soils
ATM 408	Mechanical Analysis of Extracted Aggregate
ATM 401	Sampling Bituminous Materials
ATM 307	Percentage of Fracture in Coarse Aggregate
ATM 204	Liquid Limit of Soils
ATM 205	Plastic Limit and Plasticity Index of Soils
ATM 410	Bulk Specific Gravity and Percent Compaction of Bituminous Mixes
ATM 402	Sampling Bituminous Mixes
ATM 307	Sand Equivalent
ATM 409	Maximum Specific Gravity of Bituminous Mixes
ATM 202	Moisture Content of Aggregate and Soils
ATM 406	Asphalt Binder Content of Bituminous Mixes by Ignition Method
ATM 407	Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method
ATM 411	In-Place Density of Bituminous Mixes using the Nuclear Moisture-Density Gauge.
ATM 305	Determining the Percentage of Fracture in Coarse Aggregate.
ATM 306	Flat and Elongated
ATM 313	Degradation Value of Aggregate
ATM 405	Asphalt Cement Content of Asphalt Concrete Mixtures by the Nuclear Method
ATM 414	Anti-Strip Requirements of Hot Mix Asphalt
ATM 417	Hot Mix Asphalt Design by the Marshall Method
ATM SP-7	Determination of Outlier Test Results

AASHTO T 53	Softening Point of Bitumen (Ring-and-Ball Apparatus)
AASHTO T 96	Resistance to Degradation of Small-size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 127	Sampling and Amount of Testing of Hydraulic Cement
AASHTO M 156	Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
AASHTO T 195	Determining Degree of Particle Coating of Bituminous-Aggregate Mixtures
AASHTO M 320	Performance-Graded Asphalt Binder
ASTM D3244	Utilization of Test Data to Determine Conformance with Specifications
ASTM D5801	Test Method for Toughness and Tenacity of Bituminous Materials
The Asphalt Institute	Mix Design Methods for Asphalt Concrete Manual No. 2 (MS-2)
The Asphalt Institute	Hot-Mix Recycling Manual No. 20 (MS-20)

MATERIAL REQUIREMENTS

AASHTO R 14	Classifying Hot-Mix Recycling Agents
AASHTO M 17	Mineral Filler for Bituminous Paving Mixtures

ITEM P-403 HOT MIX ASPHALT (HMA) PAVEMENT BASE COURSE

DESCRIPTION

403-1.1 This item shall consist of a base course composed of mineral aggregate and asphalt cement binder (asphalt binder) mixed in a central mixing plant and placed on a prepared course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

403-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel crushed slag, screenings, natural sand and mineral filler, as required. The aggregates should be free of ferrous sulfides, such as pyrite, that would cause "rust" staining that can bleed through pavement markings. The portion retained on the No. 4 (4.75 mm) sieve is coarse aggregate. The portion passing the No. 4 (4.75 mm) sieve and retained on the No. 200 (0.075 mm) sieve is fine aggregate, and the portion passing the No. 200 (0.075 mm) sieve is mineral filler.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the bituminous material and free from organic matter and other deleterious substances. The percentage of wear shall not be greater than 50 percent when tested in accordance with ASTM C131. The sodium sulfate soundness loss shall not exceed 12%, or the magnesium sulfate soundness loss shall not exceed 18%, after five cycles, when tested in accordance with ASTM C88. Clay Lumps and friable particles shall not exceed 1.0% when tested in accordance with ASTM C142.

Aggregate shall contain at least 75 percent by weight of individual pieces having two or more fractured faces and 80 percent by weight having at least one fractured face. The area of each face shall be equal to at least 75% of the smallest midsectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces. Fractured faces shall be achieved by crushing.

The aggregate shall not contain more than a total of 8%, by weight, of flat particles, elongated particles, and flat and elongated particles, when tested in accordance with ASTM D4791 with a value of 5:1.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel that meets the requirements for wear and soundness specified for coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter.

The fine aggregate, including any blended material for the fine aggregate, shall have a plasticity index of not more than six (6) and a liquid limit of not more than 25 when tested in accordance with ASTM D4318.

The soundness loss shall not exceed 10% when sodium sulfate is used or 15% when magnesium sulfate is used, after five cycles, when tested per ASTM C88.

Clay lumps and friable particles shall not exceed 1.0 percent, by weight, when tested in accordance with ASTM C142.

Natural (non-manufactured) sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this specification. The fine aggregate shall not contain more than 15% natural sand by weight of total aggregates. If used, the natural sand shall meet the requirements of ASTM D1073 and shall have a plasticity index of not more than six (6) and a liquid limit of not more than 25 when tested in accordance with ASTM D4318.

The aggregate shall have sand equivalent values of 45 or greater when tested in accordance with ASTM D2419.

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate, and ASTM C183 shall be used in sampling mineral filler.

403-2.2 Mineral filler. If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D242.

403-2.3 Asphalt cement binder. Asphalt cement binder shall conform to ASTM D6373 Performance Grade (PG) **58-28**. A certificate of compliance from the manufacturer shall be included with the mix design submittal.

The supplier's certified test report with test data indicating grade certification for the asphalt binder shall be provided to the Engineer for each load at the time of delivery to the mix plant. A certified test report with test data indicating grade certification for the asphalt binder shall also be provided to the Engineer for any modification of the asphalt binder after delivery to the mix plant and before use in the HMA.

403-2.4 Preliminary material acceptance. Prior to delivery of materials to the job site, the Contractor shall submit certified test reports to the Engineer for the following materials:

a. Coarse aggregate:

- (1) Percent of wear
- (2) Soundness
- (3) Clay lumps and friable particles
- (4) Percent fractured faces
- (5) Flat and elongated particles
- (6) Unit weight of slag

b. Fine aggregate:

- (1) Liquid limit and Plasticity index
- (2) Soundness
- (3) Clay lumps and friable particles
- (4) Percent natural sand
- (5) Sand equivalent

c. Mineral filler.

d. Asphalt binder. Test results for asphalt binder shall include temperature/viscosity charts for mixing and compaction temperatures.

The certifications shall show the appropriate ASTM tests for each material, the test results, and a statement that the material meets the specification requirement.

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

403-2.5 Anti-stripping agent. Any anti-stripping agent or additive if required shall be heat stable, shall not change the asphalt cement viscosity beyond specifications, shall contain no harmful ingredients, shall

be added in recommended proportion by approved method, and shall be a material approved by the Owner.

COMPOSITION

403-3.1 Composition of mixture. The HMA plant mix shall be composed of a mixture of well-graded aggregate, filler and anti-strip agent if required, and asphalt binder. The several aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

403-3.2 Job mix formula. No hot-mixed asphalt (HMA) for payment shall be produced until a JMF has been approved in writing by the Engineer. The asphalt mix design and JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 403-3.4. The HMA shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. ASTM D6926 shall be used for preparation of specimens using the manually held and operated hammer for the mix design procedure. ASTM D6927 shall be used for testing for Marshall stability and flow.

If material variability exceeds the standard deviations indicated, the JMF and subsequent production targets shall be based on a stability greater than shown in Table 1 and the flow shall be targeted close to the mid-range of the criteria in order to meet the acceptance requirements.

The design criteria in Table 1 are target values necessary to meet the acceptance requirements contained in paragraph 403-5.2b. The criteria are based on a production process which has a material variability with the following standard deviations: Stability = 270 lbs (1200 N); Flow (0.01 inch (0.25 mm)) = 1.5 inches (38 mm); Air Voids = 0.65%.

Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D4867, shall not be less than 75 when tested at a saturation of 70-80% or an anti-stripping agent shall be added to the HMA, as necessary, to produce a TSR of not less than 75 when tested at a saturation of 70-80%. If an anti-strip agent is required, it shall be provided by the Contractor at no additional cost to the Owner.

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates currently being produced.

The submitted JMF shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- a. Percent passing each sieve size for total combined gradation, individual gradation of all aggregate stockpiles and percent by weight of each stockpile used in the JMF.
- b. Percent of asphalt cement.
- c. Asphalt performance, grade, and type of modifier if used.
- d. Number of blows per side of molded specimen.
- e. Laboratory mixing temperature.
- f. Laboratory compaction temperature.
- g. Temperature-viscosity relationship of the PG asphalt cement binder showing acceptable range of mixing and compaction temperatures and for modified binders include supplier recommended mixing and compaction temperatures.
- h. Plot of the combined gradation on the 0.45 power gradation curve.

- i. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content.
- j. Specific gravity and absorption of each aggregate.
- k. Percent natural sand.
- l. Percent fractured faces.
- m. Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- n. Tensile Strength Ratio (TSR).
- o. Anti-strip agent (if required).
- p. Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

The Contractor shall submit to the Engineer the results of verification testing of three (3) asphalt samples prepared at the optimum asphalt content. The average of the results of this testing shall indicate conformance with the JMF requirements specified in Tables 1 and 3.

When the project requires asphalt mixtures of differing aggregate gradations, a separate JMF and the results of JMF verification testing shall be submitted for each mix.

The JMF for each mixture shall be in effect until a modification is approved in writing by the Engineer. Should a change in sources of materials be made, a new JMF must be submitted within 15 days and approved by the Engineer in writing before the new material is used. After the initial production JMF has been approved by the Engineer and a new or modified JMF is required for whatever reason, the subsequent cost of the Engineer's approval of the new or modified JMF will be borne by the Contractor. There will be no time extension given or considerations for extra costs associated with the stoppage of production paving or restart of production paving due to the time needed for the Engineer to approve the initial, new or modified JMF.

Table 1. Marshall Design Criteria

Test Property	Pavements designed for aircraft gross weights of 60,000 lbs (27216 kg) or more or tire pressures of 100 psi or more	Pavements designed for aircraft gross weights less than 60,000 lbs (27216 kg) or tire pressures less than 100 psi
Number of Blows	75	50
Stability, pounds (Newtons) minimum	1800 (8006)	1000 (4448)
Flow¹, 0.01 inch (0.25 mm)	8-16	8-20
Air Voids (percent)	3.5	3.5
Percent Voids in Mineral Aggregate (minimum)	See Table 2.	See Table 2.

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

Table 2. Minimum Percent Voids In Mineral Aggregate (VMA)

Aggregate (See Table 3)	Minimum VMA
Gradation 3	16
Gradation 2	15
Gradation 1	14

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 3 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 3 represent the limits that shall determine the suitability of aggregate for use from the sources of supply, 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 sieve, or vice versa.

Table 3. Aggregate - HMA Pavements

Sieve Size	Percentage by Weight Passing Sieve
3/4 inch (19 mm)	100
1/2 inch (12 mm)	79-99
3/8 inch (9 mm)	68-88
No. 4 (4.75 mm)	48-68
No. 8 (2.36 mm)	33-53
No. 16 (1.18 mm)	20-40
No. 30 (0.60 mm)	14-30
No. 50 (0.30 mm)	9-21
No. 100 (0.15 mm)	6-16
No. 200 (0.075 mm)	3-6
Asphalt Percent:	
Stone or gravel	5.0-7.5

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

403-3.3 Reclaimed asphalt concrete (RAP). RAP shall not be used.

403-3.4 Job mix formula (JMF) laboratory. The Contractor's laboratory used to develop the JMF shall be accredited in accordance with ASTM D3666. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the JMF must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.

403-3.5 Test section. Prior to full production, the Contractor shall prepare and place a quantity of HMA according to the JMF. The amount of HMA shall be sufficient to construct a test section 500' long and 24' wide, placed in two lanes, with a longitudinal cold joint, and shall be of the same depth specified for the construction of the course which it represents. A cold joint for this test section is an exposed construction joint at least four (4) hours old or whose mat has cooled to less than 160°F (71°C). The cold joint must be cut back using the same procedure that will be used during production in accordance with 403-4.12. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

The test section shall be evaluated for acceptance as a single lot in accordance with the acceptance criteria in paragraph 403-5.1 and 403-5.2. The test section shall be divided into equal sublots. As a minimum the test section shall consist of three (3) sublots.

The test section shall be considered acceptable if the average mat density of the test section cores is greater than or equal to 96% and the average joint density of the test section cores is greater than or equal to 94%.

If the initial test section should prove to be unacceptable, the necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made. A second test section shall then be placed. If the second test section also does not meet specification requirements, both sections shall be removed at the Contractor's expense. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. Any additional sections that are not acceptable shall be removed at the Contractor's expense. Full production shall not begin until an acceptable test section has been constructed and accepted in writing by the Engineer. Once an acceptable test section has been placed, payment for the initial test section and the section that meets specification requirements shall be made in accordance with paragraph 403-8.1.

Job mix control testing shall be performed by the Contractor at the start of plant production and in conjunction with the calibration of the plant for the JMF. If the aggregates produced by the plant do not satisfy the gradation requirements or produce a mix that meets the JMF, it will be necessary to reevaluate and redesign the mix using plant-produced aggregates. Specimens shall be prepared and the optimum asphalt content determined in the same manner as for the original JMF tests.

Contractor will not be allowed to place the test section until the Contractor Quality Control Program, showing conformance with the requirements of paragraph 403-6.1, has been approved, in writing, by the Engineer.

CONSTRUCTION METHODS

403-4.1 Weather limitations. The HMA shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	Degrees F	Degrees C
3 inches (7.5 cm) or greater	40	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

403-4.2 HMA plant. Plants used for the preparation of HMA shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 with the following changes:

a. Requirements for all plants include:

(1) Truck scales. The HMA shall be weighed on approved scales furnished by the Contractor, or on certified public scales at the Contractor's expense. Scales shall be inspected and sealed as often as the Engineer deems necessary to assure their accuracy. Scales shall conform to the requirements of the General Provisions, subsection 90-01.

In lieu of scales, and as approved by the Engineer, HMA weights may be determined by the use of an electronic weighing system equipped with an automatic printer that weighs the total HMA production and as often thereafter as requested by the Engineer.

(2) Testing facilities. The Contractor shall ensure laboratory facilities are provided at the plant for the use of the Engineer. The lab shall have sufficient space and equipment so that both testing representatives (Engineer's and Contractor's) can operate efficiently. The lab shall meet the requirements of ASTM D3666 including all necessary equipment, materials, and current reference standards to comply with the specifications and masonry saw with diamond blade for trimming pavement cores and samples. The plant testing laboratory shall have a floor space area of not less than 200 square feet (18.5 sq m), with a ceiling height of not less than 7-1/2 feet (2 m). The laboratory shall be weather tight, sufficiently heated in cold weather, air-conditioned in hot weather to maintain temperatures for testing purposes of 70°F ±5°F (21°C ±2.3°C). The plant testing laboratory shall be located on the plant site to provide an unobstructed view, from one of its windows, of the trucks being loaded with the plant mix materials. In addition, the facility shall include the minimum:

- (a) Adequate artificial lighting.
- (b) Electrical outlets sufficient in number and capacity for operating the required testing equipment and drying samples.
- (c) A minimum of two (2) Underwriter's Laboratories approved fire extinguishers of the appropriate types and class.
- (d) Work benches for testing.
- (e) Desk with chairs and file cabinet.
- (f) Sanitary facilities convenient to testing laboratory.
- (g) Exhaust fan to outside air.
- (h) Sink with running water.

Failure to provide the specified facilities shall be sufficient cause for disapproving HMA plant operations.

Laboratory facilities shall be kept clean, and all equipment shall be maintained in proper working condition. The Engineer shall be permitted unrestricted access to inspect the Contractor's laboratory facility and witness quality control activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

(3) Inspection of plant. The Engineer, or Engineer's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

(4) Storage bins and surge bins. The HMA stored in storage and surge bins shall meet the same requirements as HMA loaded directly into trucks and may be permitted under the following conditions:

- (a) Stored in non-insulated bins for a period of time not to exceed three (3) hours.
- (b) Stored in insulated storage bins for a period of time not to exceed eight (8) hours.

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

403-4.3 Hauling equipment. Trucks used for hauling HMA shall have tight, clean, and smooth metal beds. To prevent the HMA from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the Engineer. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

403-4.3.1 Material transfer vehicle (MTV). Material transfer Vehicles shall be required due to the improvement in smoothness and decrease in both physical and thermal segregation. To transfer the material from the hauling equipment to the paver, use a self-propelled, material transfer vehicle with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The Material Transfer Vehicle will have remixing and storage capability to prevent physical and thermal segregation.

403-4.4 HMA pavers. HMA pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of HMA that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the HMA uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

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

403-4.4.1 Automatic grade control. The HMA paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices that will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within $\pm 0.1\%$.

The controls shall be capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet (9 m) in length
- b. Taut stringline (wire) set to grade
- c. Short ski or shoe
- d. Laser control

403-4.5 Rollers. Rollers of the vibratory, steel wheel, and pneumatic-tired type shall be used. They shall be in good condition, capable of operating at slow speeds to avoid displacement of the HMA. The number, type, and weight of rollers shall be sufficient to compact the HMA to the required density while it is still in a workable condition.

All rollers shall be specifically designed and suitable for compacting hot mix bituminous concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used. Depressions in pavement surfaces caused by rollers shall be repaired by the Contractor at their own expense.

The use of equipment that causes crushing of the aggregate will not be permitted.

403-4.5.1 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall also supply a qualified technician during all paving operations to calibrate the density gauge and obtain accurate density readings for all new HMA. These densities shall be supplied to the Engineer upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

403-4.6 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F

(160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

403-4.7 Preparation of mineral aggregate. The aggregate for the HMA shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

403-4.8 Preparation of HMA. The aggregates and the asphalt binder shall be weighed or metered and introduced into the mixer in the amount specified by the JMF.

The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all HMA upon discharge shall not exceed 0.5%.

For batch plants, wet mixing time begins with the introduction of asphalt binder into the mixer and ends with the opening of the mixer discharge gate. Distribution of aggregate and asphalt binder as they enter the pugmill, speed of mixer shafts, and arrangement and pitch of paddles are factors governing efficiency of mixing. Prolonged exposure to air and heat in the pugmill hardens the asphalt film on the aggregate. Mixing time, therefore, should be the shortest time required to obtain uniform distribution of aggregate sizes and thorough coating of aggregate particles with asphalt binder.

403-4.9 Preparation of the underlying surface. Immediately before placing the HMA, the underlying course shall be cleaned of all dust and debris. A prime coat shall be applied in accordance with Item P-602, if shown on the plans.

403-4.10 Laydown plan, transporting, placing, and finishing. Prior to the placement of the HMA, the Contractor shall prepare a laydown plan for approval by the Engineer. This is to minimize the number of cold joints in the pavement. The laydown plan shall include the sequence of paving laydown by stations, width of lanes, temporary ramp locations, and laydown temperature. The laydown plan shall also include estimated time of completion for each portion of the work (that is, milling, paving, rolling, cooling, etc.). Modifications to the laydown plan shall be approved by the Engineer.

The HMA shall be transported from the mixing plant to the site in vehicles conforming to the requirements of paragraph 403-4.3. Deliveries shall be scheduled so that placing and compacting of HMA is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.

The Contractor shall use a material transfer vehicle to deliver HMA to the paver.

The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose for the first lift of all runway and taxiway pavements. Successive lifts of HMA surface course may be placed using a ski, or laser control per paragraph 403-4.4.1, provided grades of the first lift of bituminous surface course meet the tolerances of paragraphs 403-5.2b(5) as verified by a survey. Contractor shall survey each lift of HMA surface course and certify to Engineer that every lot of each lift meets the grade tolerances of paragraph 403-5.2b(5) before the next lift can be placed.

The initial placement and compaction of the HMA shall occur at a temperature suitable for obtaining density, surface smoothness, and other specified requirements but not less than 250°F (121°C).

Edges of existing HMA pavement abutting the new work shall be saw cut and carefully removed as shown on the drawings and coated with asphalt tack coat before new material is placed against it.

Upon arrival, the mixture shall be placed to the full width by a bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the HMA mat. Unless otherwise permitted, placement of the HMA shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The HMA shall be placed in consecutive adjacent strips having a minimum width of **20** feet (m) except where edge lanes require less width to complete the area. Additional screed sections shall not be attached to widen paver to meet the minimum lane width requirements specified above unless additional auger sections are added to match. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course.

Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m).

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the HMA may be spread and luted by hand tools.

Areas of segregation in the course, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of 2 inches (50 mm) deep. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

403-4.11 Compaction of HMA. After placing, the HMA shall be thoroughly and uniformly compacted by power rollers. The surface shall be compacted as soon as possible when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, the wheels shall be equipped with a scraper and kept properly moistened using a water soluble asphalt release agent approved by the Engineer.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power driven tampers. Tampers shall weigh not less than 275 pounds (125 kg), have a tamping plate width not less than 15 inches (38 cm), be rated at not less than 4,200 vibrations per minute, and be suitably equipped with a standard tamping plate wetting device.

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

403-4.12 Joints. The formation of all joints shall be made in such a manner as to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade. The roller shall not pass over the unprotected end of the freshly laid HMA except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh HMA against the joint.

Longitudinal joints which are have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise

defective shall be cut back 3 inches (75 mm) to 6 inches (150 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material shall be removed from the project. A asphalt tack coat or other product approved by the Engineer shall be applied to the clean, dry joint prior to placing any additional fresh HMA against the joint. Any laitance produced from cutting joints shall be removed by vacuuming and washing. The cost of this work shall be considered incidental to the cost of the HMA.

The Contractor may provide additional joint density quality control by use of joint heaters at the Contractor's expense. Electrically powered infrared heating equipment should consist of one or more low-level radiant energy heaters to uniformly heat and soften the pavement joints. The heaters should be configured to uniformly heat an area up to 18 inches (0.5 m) in width and 3 inches (75 mm) in depth. Infrared equipment shall be thermostatically controlled to provide a uniform, consistent temperature increase throughout the layer being heated up to a maximum temperature range of 200°F to 300°F (93°C to 150°C).

Propane powered infrared heating equipment shall be attached to the paving machine and the output of infrared energy shall be in the one to six micron range. Converters shall be arranged end to end directly over the joint to be heated in sufficient numbers to continuously produce, when in operation, a minimum of 240,000 BTU per hour. The joint heater shall be positioned not more than one inch (25 mm) above the pavement to be heated and in front of the paver screed and shall be fully adjustable. Heaters will be required to be in operation at all times.

The heaters shall be operated so they do not produce excessive heat when the units pass over new or previously paved material.

403-4.13 Diamond grinding. When required, diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive. The saw blades shall be assembled in a cutting head mounted on a machine designed specifically for diamond grinding that will produce the required texture and smoothness level without damage to the pavement. The saw blades shall be 1/8-inch (3-mm) wide and there shall be a minimum of 55 to 60 blades per 12 inches (300 mm) of cutting head width; the actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Each machine shall be capable of cutting a path at least 3 feet (0.9 m) wide. Equipment that causes ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. The depth of grinding shall not exceed 1/2 inch (13mm) and all areas in which diamond grinding has been performed will be subject to the final pavement thickness tolerances specified. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. Areas that have been ground will be sealed with a P-608 surface treatment as directed by the Engineer. It may be necessary to seal a larger area to avoid surface treatment creating any conflict with runway or taxiway markings.

403-4.14 Nighttime Paving Requirements. Paving during nighttime construction shall require the following:

- a. All paving machines, rollers, distribution trucks and other vehicles required by the Contractor for his operations shall be equipped with artificial illumination sufficient to safely complete the work.
- b. Minimum illumination level shall be 20 horizontal foot-candles and maintained in the following areas:
 - (1) An area of 30 feet (9 m) wide by 30 feet (9 m) long immediately behind the paving machines during the operations of the machines.
 - (2) An area 15 feet (4.5 m) wide by 30 feet (9 m) long immediately in front and back of all rolling equipment, during operation of the equipment.
 - (3) An area 15 feet (4.5 m) wide by 15 feet (4.5 m) long at any point where an area is being tack coated prior to the placement of pavement.
- c. As partial fulfillment of the above requirements, the Contractor shall furnish and use, complete artificial lighting units with a minimum capacity of 3,000 watt electric beam lights, affixed to all equipment in such a way to direct illumination on the area under construction.

- d. A lighting plan must be submitted by the Contractor and approved by the Engineer prior to the start of any nighttime work.

MATERIAL ACCEPTANCE

403-5.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Engineer at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

Testing organizations performing these tests shall be accredited in accordance with ASTM D3666. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction. All equipment in Contractor furnished laboratories shall be calibrated by an independent testing organization prior to the start of operations.

- a. Hot mixed asphalt.** Plant-produced HMA shall be tested for air voids and stability and flow on a lot basis. Sampling shall be from material deposited into trucks at the plant or from trucks at the job site. Samples shall be taken in accordance with ASTM D979.

A standard lot shall be equal to one day's production or 2000 tons (1814 metric tons) whichever is smaller. If the day's production is expected to exceed 2000 tons (1814 metric tons), but less than 4000 tons (3628 metric tons), the lot size shall be 1/2 day's production. If the day's production exceeds 4000 tons (3628 metric tons), the lot size shall be an equal sized fraction of the day's production, but shall not exceed 2000 tons (1814 metric tons).

Where more than one plant is simultaneously producing HMA for the job, the lot sizes shall apply separately for each plant.

- (1) Sampling.** Each lot will consist of four equal sublots. Sufficient HMA for preparation of test specimens for all testing will be sampled by the Engineer on a random basis, in accordance with the procedures contained in ASTM D3665. Samples will be taken in accordance with ASTM D979.

The sample of HMA may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to stabilize to compaction temperature. The compaction temperature of the specimens shall be as specified in the JMF.

- (2) Testing.** Sample specimens shall be tested for stability and flow in accordance with ASTM D6927. Air voids will be determined by the Engineer in accordance with ASTM D3203. One set of laboratory compacted specimens will be prepared for each subplot in accordance with ASTM D6926 at the number of blows required by paragraph 403-3.2, Table 1. Each set of laboratory compacted specimens will consist of three test specimens prepared from the same sample. The manual hammer in ASTM D6926 shall be used.

Prior to testing, the bulk specific gravity of each test specimen shall be measured by the Engineer in accordance with ASTM D2726 using the procedure for laboratory-prepared thoroughly dry specimens for use in computing air voids and pavement density.

For air voids determination, the theoretical maximum specific gravity of the mixture shall be measured one time for each subplot in accordance with ASTM D2041. The value used in the air voids computation for each subplot shall be based on theoretical maximum specific gravity measurement for the subplot.

The stability and flow for each subplot shall be computed by averaging the results of all test specimens representing that subplot.

- (3) Acceptance.** Acceptance of plant produced HMA for stability, flow, and air voids shall be determined by the Engineer in accordance with the requirements of paragraph 403-5.1.

- b. In-place HMA.** HMA placed in the field shall be tested for mat and joint density on a lot basis. A standard lot shall be equal to one day's production or 2000 tons (1814 metric tons) whichever is smaller. If the day's production is expected to exceed 2000 tons (1814 metric tons), but less than

4000 tons (3628 metric tons), the lot size shall be 1/2 day's production. If the day's production exceeds 4000 tons (3628 metric tons), the lot size shall be an equal sized fraction of the day's production, but shall not exceed 2000 tons (1814 metric tons).

(1) Mat density. The lot size shall be the same as that indicated in paragraph 403-5.1a. The lot shall be divided into four equal sublots. One core of finished, compacted HMA shall be taken by the Contractor from each subplot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint.

(2) Joint density. The lot size shall be the total length of longitudinal joints constructed by a lot of HMA as defined in paragraph 403-5.1a. The lot shall be divided into four equal sublots. One core of finished, compacted HMA shall be taken by the Contractor from each subplot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D3665. All cores for joint density shall be taken centered on the joint. The minimum core diameter for joint density determination shall be 5 inches (125 mm).

(3) Sampling. Samples shall be neatly cut with a diamond core drill bit. Samples will be taken in accordance with ASTM D979. The minimum diameter of the sample shall be 5 inches (125 mm). Samples that are defective, as a result of sampling, shall be discarded and another sample taken. The Contractor shall furnish all tools, labor, and materials for cutting samples, cleaning, and filling the cored pavement. Cored pavement shall be cleaned and core holes shall be filled in a manner acceptable to the Engineer and within one day after sampling. Laitance produced by the coring operation shall be removed immediately. The top most lift of bituminous material shall be completely bonded to the underlying layers of bituminous material. If any of the cores reveal that the surface is not bonded to the bituminous layer immediately below the surface then additional cores shall be taken as directed by the Engineer in accordance with paragraph 403-5.1b to determine the extent of any delamination. All delaminated areas shall be completely removed by milling to the limits and depth and replaced as directed by the Engineer at no additional cost.

(4) Testing. The bulk specific gravity of each cored sample will be measured by the Engineer in accordance with ASTM D2726. Samples will be taken in accordance with ASTM D979. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each subplot sample by the average bulk specific gravity of all laboratory prepared specimens for the lot, as determined in paragraph 403-5.1a(2). The bulk specific gravity used to determine the joint density at joints formed between different lots shall be the lowest of the bulk specific gravity values from the two different lots.

(5) Acceptance. Acceptance of field placed HMA for mat density will be determined by the Engineer in accordance with the requirements of paragraph 403-5.2b(1). Acceptance for joint density will be determined by the Engineer in accordance with the requirements of paragraph 403-5.2b(2).

c. Partial lots HMA. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot, or when the Contractor and Engineer agree in writing to allow overages or other minor tonnage placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

The last batch produced where production is halted will be sampled, and its properties shall be considered as representative of the particular subplot from which it was taken. In addition, an agreed to minor placement will be sampled, and its properties shall be considered as representative of the particular subplot from which it was taken. Where three sublots are produced, they shall constitute a lot. Where one or two sublots are produced, they shall be incorporated into the next lot, and the total number of sublots shall be used in the acceptance plan calculation, that is, $n = 5$ or $n = 6$, for example. Partial lots at the end of asphalt production on the project shall be included with the previous lot. The lot size for field placed material shall correspond to that of the plant material, except that, in no cases, shall less than three (3) cored samples be obtained, that is, $n = 3$.

403-5.2 Acceptance criteria.

a. General. Acceptance will be based on the following characteristics of the HMA and completed pavement and test results:

- (1) Air Voids
- (2) Mat density
- (3) Joint density
- (4) Thickness
- (5) Smoothness
- (6) Grade
- (7) Stability
- (8) Flow

Mat density will be evaluated for acceptance in accordance with paragraph 403-5.2b(1). Stability and flow will be evaluated for acceptance in accordance with paragraph 403-5.1. Joint density will be evaluated for acceptance in accordance with paragraph 403-5.2b(2).

Thickness will be evaluated by the Engineer for compliance in accordance with paragraph 403-5.2b(3). Acceptance for smoothness will be based on the criteria contained in paragraph 403-5.2b(4). Acceptance for grade will be based on the criteria contained in paragraph 403-5.2b(5).

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

b. Acceptance criteria.

(1) Mat density. Acceptance of each lot of plant produced material for mat density shall be based on the average of all of the densities taken from the sublots. If the average mat density of the lot so established equals or exceeds 96%, the lot shall be acceptable. If the average mat density of the lot is below 96%, the lot shall be removed and replaced at the Contractor's expense.

(2) Joint density. Acceptance of each lot of plant produced HMA for joint density shall be based on the average of all of the joint densities taken from the sublots. If the average joint density of the lot so established equals or exceeds 94%, the lot shall be acceptable. If the average joint density of the lot is less than 94%, the Contractor shall stop production and evaluate the method of compacting joints. Production may resume once the reason for poor compaction has been determined and appropriate measures have been taken to ensure proper compaction.

(3) Thickness. Thickness of each course shall be evaluated by the Engineer for compliance to the requirements shown on the plans. Measurements of thickness shall be made by the Engineer using the cores extracted for each subplot for density measurement. The maximum allowable deficiency at any point shall not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, shall not be less than the indicated thickness. Where thickness deficiency exceeds the specified tolerances, the lot or subplot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the Engineer to circumscribe the deficient area.

(4) Grade. Grade shall be evaluated on the first day of placement and then every 2,000 square yards to allow adjustments to paving operations if measurements do not meet specification requirements. The Contractor must submit the survey data to the Engineer by the following day after measurements have been taken. The finished surface of the pavement shall not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm). The finished grade of each lot will be determined by running levels at intervals of 50 feet (15 m) or

less longitudinally and all breaks in grade transversely (not to exceed 50 feet (15 m)) to determine the elevation of the completed pavement. The Contractor shall pay the cost of surveying of the level runs that shall be performed by a licensed surveyor. The documentation, stamped and signed by a licensed surveyor, shall be provided by the Contractor to the Engineer. The lot size shall be 2000 square yards (square meters). When more than 15% of all the measurements within a lot are outside the specified tolerance, or if any one shot within the lot deviates 3/4 inch (19 mm) or more from planned grade, the Contractor shall remove the deficient area to the depth of the final course of pavement and replace with new material. Skin patching shall not be permitted. Isolated high points may be ground off providing the course thickness complies with the thickness specified on the plans. High point grinding will be limited to 15 square yard (12.5 sq m). The surface of the ground pavement shall have a texture consisting of grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide. The peaks and ridges shall be approximately 1/32 inch (1 mm) higher than the bottom of the grooves. The pavement shall be left in a clean condition. The removal of all of the slurry resulting from the grinding operation shall be continuous. The grinding operation should be controlled so the residue from the operation does not flow across other lanes of pavement. Areas in excess of 15 square yard (12.5 sq m) will require removal and replacement of the pavement in accordance with the limitations noted above. Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

c. Density outliers. If the tests within a lot include a very large or a very small value that appears to be outside the normal limits of variation, check for an outlier in accordance with ASTM E178, at a significance level of 5%, to determine if this value should be discarded.

403-5.3 Resampling Pavement for Mat Density.

a. General. Resampling of a lot of pavement will only be allowed for mat density and then, only if the Contractor requests same in writing, within 48 hours after receiving the written test results from the Engineer. A retest will consist of all the sampling and testing procedures contained in paragraphs 403-5.1. Only one resampling per lot will be permitted.

(1) A redefined mat density shall be calculated for the resampled lot. The number of tests used to calculate the redefined mat density shall include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined mat density for a resampled lot shall be used to evaluate the acceptance of that lot in accordance with paragraph 403-5.2.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

CONTRACTOR QUALITY CONTROL

403-6.1 General. The Contractor shall perform quality control sampling, testing, and inspection during all phases of the work and shall perform them at a rate sufficient to ensure that the work conforms to the contract requirements, and at minimum test frequencies required by paragraph 403-6.3, including but not limited to:

- a. Mix Design
- b. Aggregate Grading
- c. Quality of Materials
- d. Stockpile Management
- e. Proportioning
- f. Mixing and Transportation
- g. Placing and Finishing
- h. Joints

- i. Compaction
- j. Surface smoothness
- k. Personnel
- l. Laydown plan

The Contractor shall perform quality control sampling, testing, and inspection during all phases of the work and shall perform them at a rate sufficient to ensure that the work conforms to the contract requirements, and at minimum test frequencies required by paragraph 403-6.3 and Section 100 of the General Provisions. As a part of the process for approving the Contractor's plan, the Engineer may require the Contractor's technician to perform testing of samples to demonstrate an acceptable level of performance.

No partial payment will be made for materials that are subject to specific quality control requirements without an approved plan.

403-6.2 Contractor testing laboratory. The lab shall meet the requirements of ASTM D3666 including all necessary equipment, materials, and current reference standards to comply with the specifications.

403-6.3 Quality control testing. The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved Quality Control Program. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

a. Asphalt content. A minimum of two asphalt content tests shall be performed per lot in accordance with ASTM D6307 or ASTM D2172 if the correction factor in ASTM D6307 is greater than 1.0. The asphalt content for the lot will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ASTM D5444 and ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C566.

d. Moisture content of HMA. The moisture content of the HMA shall be determined once per lot in accordance with ASTM D1461

e. Temperatures. Temperatures shall be checked, at least four times per lot, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the HMA at the plant, and the HMA at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Additional testing. Any additional testing that the Contractor deems necessary to control the process may be performed at the Contractor's option.

h. Monitoring. The Engineer reserves the right to monitor any or all of the above testing.

403-6.4 Sampling. When directed by the Engineer, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

403-6.5 Control charts. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each subplot will be calculated and monitored by the Quality Control laboratory.

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

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the JMF target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits For Individual Measurements		
Sieve	Action Limit	Suspension Limit
3/4 inch (19 mm)	±6%	±9%
1/2 inch (12 mm)	±6%	±9%
3/8 inch (9 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (0.30 mm)	±3%	±4.5%
No. 200 (0.075 mm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
VMA	-1.00%	-1.5%

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

Control Chart Limits Based On Range (Based On $n = 2$)	
Sieve	Suspension Limit
1/2 inch (12 mm)	11%
3/8 inch (9 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (0.30 mm)	6%
No. 200 (0.075 mm)	3.5%
Asphalt Content	0.8%

c. Corrective action. The Contractor Quality Control Program shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain sets of

rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

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

403-6.6 Quality control reports. The Contractor shall maintain records and shall submit reports of quality control activities daily, in accordance with the Contractor Quality Control Program described in General Provisions, Section 100.

METHOD OF MEASUREMENT

403-7.1 Measurement. Plant mix bituminous concrete pavement shall be measured by the number of tons (kg) of HMA used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

403-8.1 Payment. Payment for a lot of HMA meeting all acceptance criteria as specified in paragraph 403-5.2 shall be made at the contract unit price per ton (kg) for HMA. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-403a	HMA Base Course - per ton
Item P-403c	Asphalt Cement, PG 52-28 – per ton

TESTING REQUIREMENTS

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C183	Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D979	Standard Practice for Sampling Bituminous Paving Mixtures

ASTM D1073	Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
ASTM D1074	Standard Test Method for Compressive Strength of Bituminous Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4125	Standard Test Methods for Asphalt Content of Bituminous mixtures by the Nuclear Method
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5581	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen)
ASTM D6307	Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method

ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
AASHTO T030	Standard Method of Test for Mechanical Analysis of Extracted Aggregate
AASHTO T110	Standard Method of Test for Moisture or Volatile Distillates in Hot Mix Asphalt (HMA)
AASHTO T275	Standard Method of Test for Bulk Specific Gravity (Gsb) of Compacted Hot Mix Asphalt (HMA) Using Paraffin-Coated Specimens).

Asphalt Institute Handbook MS-26

Asphalt Binder

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

MATERIAL REQUIREMENTS

ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder

ITEM P-603 TACK COAT

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with liquid asphalt material according to these Specifications and in reasonably close conformity to the lines shown on the Plans.

MATERIALS

603-2.1 MATERIALS. Tack coat material shall be either cutback asphalt, emulsified asphalt, or tar and shall conform to the requirements of Table 1. The type, grade, controlling specification, and application temperature of tack coat to be used shall be specified by the Engineer.

TABLE 1. MATERIAL

Type and Grade	Specification	Application Temperature °F	Application Rate gal/yd ²
Emulsified Asphalt			
SS-1, SS-1h	AASHTO M 140	75-130	0.05 to 0.16
CSS-1, CSS-1h	AASHTO M 208	75-130	0.05 to 0.16
STE-1	\1\	68-140	0.08 to 0.10
Cutback Asphalt			
RC-70	ASTM D 2028	120-160	0.05 to 0.16
Tar			
RTCB 5, RTCB 6	AASHTO M 52	60-120	0.05 to 0.16

\1\ STE-1 shall meet the following specifications: Viscosity, Sabolt Furol at 77 °F of 30 max., when tested under AASHTO T 59. Particle charge test of Positive when tested under AASHTO T 59 (If particle charge test is inconclusive, material having a max. pH value of 6.7 will be acceptable). Storage Stability, 1 day 1% max when tested under AASHTO T 59. Demulsibility, 35 mil 0.8% Dioctyl Sodium Sulfosuccinate Solution 25 minimum when tested under AASHTO T 59. Sieve test maximum of 0.10% when tested under AASHTO T 59. Oil distillate, by volume of emulsion, of 5% maximum when tested under AASHTO T 59. Residue of 45% minimum when tested under AASHTO T 59. Penetration at 77 °F, 100 gm, 5 sec. of 100 minimum, 200 maximum when tested under ASTM D 5. Ductility at 77 °F of 40 cm minimum when tested under ASTM D 113. Solubility in trichloroethylene of 97.5% minimum

CONSTRUCTION METHODS

603-3.1 WEATHER LIMITATIONS. The tack coat shall be applied only when the existing surface is dry and the surface temperature is above 50 °F. The temperature requirements may be waived, but only when so directed by the Engineer.

603-3.2 EQUIPMENT. The Contractor shall provide equipment for heating and applying the tack coat.

The distributor shall be designed, equipped, maintained, and operated so that tack coat at even heat may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 10%. Distributor equipment shall include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank

contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

A power broom and/or blower shall be provided for any required cleaning of the surface to be treated.

603-3.3 APPLICATION OF TACK COAT. Immediately before applying the tack coat, the full width of surface to be treated shall be swept with a power broom and/or airblast to remove all loose dirt and other objectionable material.

Emulsified asphalt shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before any of the overlying mixture is placed on the tacked surface.

The tack coat material including vehicle or solvent shall be uniformly applied with an asphalt distributor at the rate specified in Table 1, depending on the condition of the existing surface. The type of material and application rate shall be approved by the Engineer prior to application.

Following the application, the surface shall be allowed to cure without being disturbed for such period of time as may be necessary to permit drying out and setting of the tack coat. This period shall be determined by the Engineer. The surface shall then be maintained by the Contractor until the next course has been placed. Suitable precautions shall be taken by the Contractor to protect the surface against damage during this interval.

603-3.4 CONTRACTOR'S RESPONSIBILITY. Samples of the tack coat material that the Contractor proposes to use, together with a statement as to its source and character, must be submitted and approved before use of such material begins. The Contractor shall require the manufacturer or producer of the tack coat to furnish material subject to this and all other pertinent requirements of the contract. Only satisfactory materials so demonstrated by certified tests, shall be acceptable.

The Contractor shall furnish the vendor's certified test reports for each carload, or equivalent, of tack coat shipped to the project. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verification by testing samples of material received for use on the project.

603-3.5 FREIGHT AND WEIGH BILLS. Before the final estimate is allowed, the Contractor shall file with the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the tack coat actually used in the construction covered by the contract. The Contractor shall not remove tack coat from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer. Copies of freight bills and weigh bills shall be furnished to the Engineer during the progress of the work.

METHOD OF MEASUREMENT

603-4.1 Tack coat will be measured by the ton according to Subsection GCP-90-02.

BASIS OF PAYMENT

603.5-1 Payment will be made at the contract unit price per ton of accepted material.

Payment will be made under:

Item P-603a Tack Coat, PG 52-28 - per ton

ITEM P-610 STRUCTURAL PORTLAND CEMENT CONCRETE

DESCRIPTION

610-1.1 This item shall consist of plain or reinforced structural portland cement concrete, prepared and constructed according to these Specifications, at the locations and of the form and dimensions shown on the Plans. This specification shall be used for all structural and miscellaneous concrete including signage bases.

MATERIALS

610-2.1 GENERAL. Only approved materials, conforming to the requirements of these Specifications, shall be used in the work. They may be subjected to inspection and tests at any time during the progress of their preparation or use. The source of supply of each of the materials shall be approved by the Engineer before delivery or use is started. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed therein.

In no case shall the use of pit-run or naturally mixed aggregates be permitted. Naturally mixed aggregate shall be screened and washed, and all fine and coarse aggregates shall be stored separately and kept clean. The mixing of different kinds of aggregates from different sources in one storage pile or alternating batches of different aggregates will not be permitted.

610-2.2 COARSE AGGREGATE. The coarse aggregate shall meet the requirements of AASHTO M 80, Class A.

Coarse aggregate shall be well graded from coarse to fine, and shall meet AASHTO M 43, Number 57 or 67, when tested according to ATM 304.

610-2.3 FINE AGGREGATE. The fine aggregate shall meet the requirements of AASHTO M 6,.

The fine aggregate shall be well graded from fine to coarse, and shall meet the requirements of AASHTO M 6, Table 1, when tested according to ATM 304.

Blending will be permitted, if necessary, in order to meet the gradation requirements for fine aggregate. Fine aggregate deficient in the percentage of material passing the No. 50 sieve may be accepted, provided that such deficiency does not exceed 5% and is remedied by the addition of pozzolanic or cementitious materials other than portland cement, as specified in 610-2.6 on admixtures, in sufficient quantity to produce the required workability as approved by the Engineer.

610-2.4 CEMENT. Cement shall conform to the requirements of AASHTO M 85.

The Contractor shall furnish manufacturer's certified test reports for each carload, or equivalent, of cement shipped to the project. The report shall be delivered to the Engineer before permission to use the cement is granted. All such test reports shall be subject to verification by testing sample materials received for use on the project.

610-2.5 WATER. The water used in concrete shall be potable and free from sewage, oil, acid, strong alkalis, vegetable matter, and clay and loam, or other substances deleterious to concrete. If the water is of questionable quality, it shall be tested according to AASHTO T 26.

610-2.6 ADMIXTURES. The use of any material added to the concrete mix shall be indicated on the mix design approved by the Engineer. The Contractors shall submit the manufacturer's product data sheet

giving the procedure for admixture use, recommended dosage range, and demonstrating admixture compatibility. The Contractors shall submit the manufacturer's product data sheet giving the procedure for admixture use, recommended dosage, and demonstrating admixture compatibility.

Air-entraining admixtures shall meet the requirements of AASHTO M 154. Air-entraining admixtures shall be added at the mixer in the amount necessary to produce the specified air content.

Water-reducing, set-controlling admixtures shall meet the requirements of AASHTO M 194, Type A water-reducing, or Type D water-reducing and retarding. Water-reducing admixtures shall be added at the mixer separately from air-entraining admixtures according to the manufacturer's printed instructions.

610-2.7 PREMOLDED JOINT MATERIAL. Premolded joint material for expansion joints shall meet the requirements of AASHTO M 213.

610-2.8 JOINT FILLER. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.9 STEEL REINFORCEMENT. Reinforcing shall consist of Deformed and Plain Billet-Steel Bars conforming to the requirements of AASHTO M 31, Welded Steel Wire Fabric conforming to the requirements of AASHTO M 55, Welded Deformed Steel Fabric conforming to the requirements of AASHTO M 221, or Bar Mats conforming to the requirements of AASHTO M 54, as shown on the Plans.

610-2.10 COVER MATERIALS FOR CURING. Curing materials shall conform to one of the following specifications:

- | | |
|---|---|
| a. Burlap Cloth made from Jute or Kenaf | AASHTO M 182 |
| b. Sheet Materials for Curing Concrete | ASTM C171 |
| c. Liquid Membrane – Forming | AASHTO M 148, Type I or II |
| d. Compounds for Curing Concrete | AASHTO M 148, Type I,
except do not use compounds using linseed oil. |

CONSTRUCTION METHODS

610-3.1 GENERAL. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified herein. All machinery and equipment owned or controlled by the Contractor, which they propose to use on the work, shall be of sufficient size to meet the requirements of the work, and shall be such as to produce satisfactory work; all work shall be subject to the inspection and approval of the Engineer.

610-3.2 CONCRETE COMPOSITION. The concrete shall develop a minimum compressive strength of 3,600 psi in 28 days as determined by test cylinders made according to ATM 506 and tested according to AASHTO T 22. The concrete shall contain not less than 564 pounds of cement per cubic yard. The concrete shall contain 5% of entrained air, plus or minus 1%, as determined by ATM 505 and shall have a slump of not more than 4 inches as determined by ATM 503.

610-3.3 ACCEPTANCE SAMPLING AND TESTING. Concrete for each structure will be accepted on the basis of the compressive strength specified in Subsection 610-3.2. The concrete will be sampled according to ATM 501. Compressive strength specimens will be made according to ATM 506 and tested according to AASHTO T 22.

The Engineer will make the actual tests on the specimens at no expense to the Contractor.

610-3.4 PROPORTIONING AND MEASURING DEVICES. When package cement is used, the quantity for each batch shall be equal to one or more whole sacks of cement. The aggregates shall be measured separately by weight. If aggregates are delivered to the mixer in batch trucks, the exact amount for each mixer charge shall be contained in each batch compartment. Weighing boxes or hoppers shall be

approved by the Engineer and shall provide means of regulating the flow of aggregates into the batch box so that the required and exact weight of aggregates can be readily obtained.

610-3.5 CONSISTENCY. The consistency of the concrete shall be checked by the slump test specified in ATM 503.

610-3.6 MIXING. Concrete may be mixed at the construction site, at a central point, or in truck mixers. The concrete shall be mixed and delivered according to the requirements of AASHTO M 157.

610-3.7 MIXING CONDITIONS. The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40 °F without permission of the Engineer. If permission is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50 °F nor more than 100 °F. The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at their expense.

Retempering of concrete by adding water or any other material shall not be permitted.

The delivery of concrete to the job shall be in such a manner that batches of concrete will be deposited at uninterrupted intervals.

610-3.8 FORMS. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the Engineer. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as designed on the Plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The Contractor shall bear responsibility for their adequacy. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes.

The internal ties shall be arranged so that, when the forms are removed, no metal will show in the concrete surface or discolor the surface when exposed to weathering. All forms shall be wetted with water or with a nonstaining mineral oil which shall be applied shortly before the concrete is placed. Forms shall be constructed so that they can be removed without injuring the concrete or concrete surface. The forms shall not be removed before the expiration of at least 30 hours from vertical faces, walls, slender columns, and similar structures; forms supported by falsework under slabs, beams, girders, arches, and similar construction shall not be removed until tests indicate that at least 80% of the design strength of the concrete has developed.

610-3.9 PLACING REINFORCEMENT. All reinforcement shall be accurately placed, as shown on the Plans, and shall be firmly held in position during concreting. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

Reinforcing bars shall be bent cold and shall conform accurately to the shape and dimensions shown on the diagram. In no case shall the radius of any bend be less than 4 times the diameter of the bar.

Place reinforcement as indicated on the Plans or as hereinafter specified. Rigidly block and wire in place, using metal or plastic supports or concrete blocks and securely tie at each intersection with annealed iron wire of at least 1/8 inch.

Do not splice bars at points not indicated on the Plans except with the consent of the Engineer. Such splices shall be at the points of minimum tensile stress and the lap shall be not less than 36 bar diameters.

Verify the quantity, size, and shape of the reinforcement against the structure drawings and make necessary corrections to the bar lists and bending schedules before ordering. Errors in the bar lists and/or bending schedules shall not be cause for adjustment of the contract prices.

If reinforcing bars are to be welded, follow AWS D12.1.

610-3.10 EMBEDDED ITEMS. Before placing concrete, any items that are to be embedded shall be firmly and securely fastened in place as indicated. All such items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The embedding of wood shall be avoided. The concrete shall be spaded and consolidated around and against embedded items.

610-3.11 PLACING CONCRETE. All concrete shall be placed during daylight, unless otherwise approved. The concrete shall not be placed until the depth and character of foundation, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved. Concrete shall be placed as soon as practical after mixing and in no case later than 1 hour after water has been added to the mix. The method and manner of placing shall be such to avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. Dropping the concrete a distance of more than 5 feet, or depositing a large quantity at one point, will not be permitted. Concrete shall be placed upon clean, damp surfaces, free from running water, or upon properly consolidated soil.

610-3.12 CONSOLIDATION OF CONCRETE. Consolidate fresh concrete within 15 minutes of its placement. Consolidate concrete using mechanical vibrators to make an impervious, dense, homogeneous mass free of voids and rock pockets. Vibrate in a uniform pattern spaced less than 1.5 times the radius of visible effectiveness. Effectively vibrate the full depth of each layer.

Do not vibrate concrete that has initially set. Do not hold vibrators against reinforcing steel or use vibrators to flow or spread the concrete into place. Do not allow the concrete to segregate, form pools of mortar, or form laitance on the surface.

610-3.13 CONSTRUCTION JOINTS. When the placing of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, such provisions shall be made for grooves, steps, keys, dovetails, reinforcing bars or other devices as may be prescribed. The work shall be arranged so that a section begun on any day shall be finished during daylight of the same day. Before depositing new concrete on or against concrete which has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly, wetted, and covered with a neat coating of cement paste or grout.

610-3.14 EXPANSION JOINTS. Expansion joints shall be constructed at such points and of such dimensions as may be indicated on the drawings. The premolded filler shall be cut to the same shape as that of the surfaces being joined. The filler shall be fixed firmly against the surface of the concrete already in place in such manner that it will not be displaced when concrete is deposited against it.

610-3.15 DEFECTIVE WORK. Any defective work disclosed after the forms have been removed shall be immediately removed and replaced. If any dimensions are deficient, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Engineer cannot be repaired satisfactorily, the entire section shall be removed and replaced at the expense of the Contractor.

610-3.16 SURFACE FINISH. All exposed concrete surfaces shall be true, smooth, free from open or rough spaces, depressions, or projections. The concrete in horizontal plane surfaces shall be brought flush with the finished top surface at the proper elevation and shall be struck-off with a straightedge and floated. Mortar finishing shall not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.

When directed, the surface finish of exposed concrete shall be a rubbed finish. If forms can be removed while the concrete is still green, the surface shall be pointed and wetted and then rubbed with a wooden float until all irregularities are removed. If the concrete has hardened before being rubbed, a carborundum stone shall be used to finish the surface. When approved, the finishing can be done with a rubbing machine.

610-3.17 CURING AND PROTECTION. All concrete shall be properly cured and protected by the Contractor. The work shall be protected from the elements, flowing water, and from defacement of any nature during the building operations. The concrete shall be cured as soon as it has sufficiently hardened by covering with an approved material. Water-absorptive coverings shall be thoroughly saturated when placed and kept saturated for a period of at least 3 days for Type III Portland Cement and at least 7 days for Type I or Type II Portland Cement Concrete. All curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to currents of air. Where wooden forms are used, they shall be kept wet at all times until removed to prevent the opening of joints and drying out of the concrete. Traffic shall not be allowed on concrete surfaces for 7 days after the concrete has been placed.

610-3.18 DRAINS OR DUCTS. Drainage pipes, conduits, and ducts that are to be encased in concrete shall be installed by the Contractor before the concrete is placed. The pipe shall be held rigidly so that it will not be displaced or moved during the placing of the concrete.

610-3.19 COLD WEATHER PROTECTION. When concrete is placed at temperatures below 40 °F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing. The aggregates, or water, or both, shall be heated in order to place the concrete at temperatures between 50 and 100 °F.

610-3.20 HOT WEATHER CONCRETE PROTECTION. When concrete is placed at temperatures above 90°F, the Contractor shall provide satisfactory mean and methods to protect the mix. Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 120°F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

610-3.21 FILLING JOINTS. All joints which require filling shall be thoroughly cleaned, and any excess mortar or concrete shall be cut out with proper tools. Joint filling shall not be started until after final curing and shall be done only when the concrete is completely dry. The cleaning and filling shall be carefully done with proper equipment and in a manner to obtain a neat looking joint free from excess filler.

610-3.22 EXCAVATION AND DISPOSAL. Excavate to the minimum depth necessary for the removal of existing structural portland cement concrete. Excavated material becomes the property of the Contractor. Remove excavated material to an approved disposal site off of airport property in accordance with applicable Federal and State regulations.

METHOD OF MEASUREMENT

610-4.1 Structural portland cement concrete will be measured by the number of cubic yards of concrete complete in place and accepted at the Gate E location only. In computing the volume of concrete for payment, the dimensions used will be those shown on the Plans or ordered by the Engineer. No measurements or other allowances will be made for excavation and disposal of existing concrete, forms, falsework, cofferdams, pumping, bracing, expansion joints, reinforcing steel, or finishing of the concrete. No deductions will be made for the volumes of reinforcing steel or embedded items. If the pay item appears at locations other than Gate E, no measurement for payment will be made.

BASIS OF PAYMENT

610-5.1 Payment for P-610a at the Gate E location will be made at the contract unit price per cubic yard for structural portland cement concrete. Reinforcing steel will be subsidiary to the work.

At all other locations, all work, materials, and equipment required to complete the work will be subsidiary to those items referencing item P-610.

Payment will be made under:

Item P-610a Structural Portland Cement Concrete - per cubic yard

TESTING REQUIREMENTS

AASHTO T 22	Compressive Strength of Cylindrical Concrete Specimens
AASHTO T 26	Quality of Water to be used in Concrete
ATM 506	Making & Curing Concrete Test Specimens in the Field
ATM 304	Sieve Analysis of Aggregates & Soils
ATM 503	Slump of Freshly Mixed Concrete
ATM 505	Air Content of Freshly Mixed Concrete by the Pressure Method
ATM 501	Sampling Freshly Mixed Concrete

MATERIAL REQUIREMENTS

AASHTO M 6	Fine Aggregate for Portland Cement Concrete
AASHTO M 31	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
AASHTO M 43	Sizes of Aggregate for Road and Bridge Construction
AASHTO M 54	Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
AASHTO M 55	Steel Welded Wire Reinforcement, Plain, for Concrete
AASHTO M 80	Coarse Aggregate for Portland Cement Concrete
AASHTO M 85	Portland Cement
AASHTO M 148	Liquid Membrane-Forming Compounds for Curing Concrete
AASHTO M 154	Air-Entraining Admixtures for Concrete
AASHTO M 157	Ready-Mixed Concrete
AASHTO M 171	Sheet Materials for Curing Concrete
AASHTO M 194	Chemical Admixture for Concrete
AASHTO M 213	Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
AASHTO M 221	Steel Welded Wire Reinforcement, Deformed, for Concrete
AASHTO M 295	Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
AWS D12.1	Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction

ITEM P-620 RUNWAY AND TAXIWAY PAINTING

DESCRIPTION

620-1.1 This item shall consist of the painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, according to these Specifications and at the locations shown on the Plans, or as directed by the Engineer. This item includes removal of existing painted markings from pavement surfaces as shown on the plans or as designated by the Engineer. Complete this work within the limitations of the project safety and phasing plans. This item includes removal of existing painted markings from pavement surfaces as shown on the plans or as designated by the Engineer. Complete this work within the limitations of the project safety and phasing plans.

MATERIALS

620-2.1 MATERIALS ACCEPTANCE. The Contractor shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site. Provide manufacturer certification that each product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

620-2.2 PAINT. Paint shall be waterborne or solvent base according to the requirements of Subsection 620-2.2, a. or b. Paint shall be furnished in accordance with Federal Standard No. 595.

<u>Fed Std. No 595 Color</u>	<u>Number</u>
White	37925
Red	31136
Yellow	33538 or 33655
Black	37038
Pink	1 part 31136 to 2 parts 37925
Green	34108

Use waterborne or solvent base black paint to outline a border at least 6 inch wide around markings on all light colored pavements. Preformed thermoplastic markings shall have a non-reflectorized black border integral to the marking

Paint shall be furnished in Type II (fast drying time for no-pick-up) when tested according to ASTM D711.

- a. **Waterborne.** Paint shall meet the requirements of Federal Specification TT-P1952E, Type II.
- b. **Solvent Base.** Paint shall meet the requirements of Federal Specification A-A-2886B, Type II, or the CBJ maintenance specification for "Traffic Paint - No-Heat Instant Dry Pavement Marking Material".

620-2.3 REFLECTIVE MEDIA. Glass beads shall meet the requirements of Fed. Spec. TT-B-1325, Type I, gradation A. Glass beads shall be treated with adhesion promoting and/or flotation coatings as specified by the manufacturer of the paint.

<u>Paint Color</u>	<u>Glass Beads, Type I, Gradation A</u>
White	See Table 1
Yellow	See Table 1
Red	See Table 1 and Note
Pink	See Table 1 and Note
Black	Not Used
Green	Not Used

620-2.4 STENCILS. Use 1/10-inch orthopedic grade plastic stencils.

CONSTRUCTION METHODS

620-3.1 WEATHER LIMITATIONS. The painting shall be performed only when the surface is dry and when the surface temperature is at least 40 °F and rising and the pavement surface temperature is at least 5 °F above the dew point.

620-3.2 EQUIPMENT. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall apply markings of uniform cross sections and clear-cut edges without running or spattering and without over spray.

The equipment used for painted marking removal shall meet the following minimum requirements:

- Mounted on a self-propelled chassis.
- Have a 1.25 hour water supply.
- UHP Pump – an ultra-high-pressure pump that produces 40,000 psi at 6 gallons per minute.
- Vacuum – volumetric flow rate of 700 CFM at 2850 RPM. Simultaneous vacuum recovery protects the environment and allows for application of new markings in 15-20 minutes on an average weather day.
- Disposal Tank – 660 gallon storage with a water filtration system that separates the water from the debris so that the debris is disposed of in a nearly dry state, while water is filtered to 100 micron.
- Water Tank – 600 gallon storage.
- Blasting Heads – single blasting head in front that can easily be adapted anywhere from 6-14 inches along with a variety of levels of aggression to match any application. Joystick control for positioning blasting head.

620-3.3 PREPARATION OF SURFACE. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material which would reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials. Areas which cannot be satisfactorily cleaned by brooming and blowing shall be scrubbed as directed with a 10% solution of tri-sodium phosphate or an equally suitable solution. After scrubbing, the solution shall be rinsed off and the surface dried prior to painting.

620-3.4 LAYOUT OF MARKINGS. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the Plans. Space control points at such intervals to ensure accurate location of all markings. Provide an experienced technician to supervise the location, alignment, layout dimensions, and application of the paint.

620-3.5 APPLICATION. Paint shall be applied at the locations and to the dimensions and spacing shown on the Plans. Paint shall not be applied until the layout and condition of the surface have been approved by the Engineer.

The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet, and the marking dimensions and spacings shall be within the following tolerances:

Dimension and Spacing	Tolerance
Less than 36 inches	1/2 inch
36 inches to 6 feet	1 inch
6 feet to 60 feet	2 inches
Over 60 feet	3 inches

The paint shall be mixed and applied according to the manufacturer's instructions. The addition of thinner will not be permitted. The paint shall be applied to the pavement with a marking machine at the rate shown in Table 1

TABLE 1. APPLICATION RATES FOR PAINT AND GLASS BEADS

Paint Type	Paint, ft ² /gal maximum	Glass Beads lb/gal of paint (±2 oz.)
Waterborne	80	7
Solvent Base	80	7

Note: Glass Bead application rate from Red and Pink paint shall be reduced by 2 lb/gal for Type I beads.

Pavement shall cure for 7 days or as directed by the Engineer before painting. If pavement is opened to traffic before the pavement curing period is complete, apply paint in two coats. Apply the first coat at least 12 hours after paving is completed at 25 percent of the total application rate. Apply the remaining 75 percent following pavement curing time and after pavement grooving operations in affected areas. The direction of the second application shall be 180 degrees from the first to ensure complete coverage. Apply glass beads, if required, in the second coat only.

Pressure apply the glass beads on the marked areas at the locations shown on the Plans using a mechanical dispenser mounted not more than 12 inches behind the paint dispenser. Beads shall be applied at the rate shown in Table 1 and shall adhere to the cured paint or all marking operations shall cease until corrections are made.

All emptied containers shall be returned to the paint storage area for checking by the Engineer. The containers shall not be removed from the airport or destroyed until authorized by the Engineer.

Use stencils for application of runway hold short markings, taxiway hold short markings, surface painted holding position signs, taxiway enhanced centerline markings, and ILS markings. Stencils become property of the State. After application and approval of painted traffic markings, deliver the clean and re-useable stencils to ADOT Maintenance and Operations as directed by the Engineer.

620-3.6 PROTECTION AND CLEANUP. After application of the paint, all markings shall be protected from damage until the paint is dry. All surfaces shall be protected from excess moisture and/or rain and from discoloration by spatter, splashes, spillage, or drippings of paint. The Contractor shall remove from the work area all debris, waste, loose or unadhered reflective media, and by-products generated by the surface preparation, marking removal, and application operations to the satisfaction of the Engineer. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and Federal environmental statutes and regulations.

620-3.7 PAINTED MARKING REMOVAL. Where indicated, use high pressure water to remove all visible indications of existing painted markings from pavement surfaces. Do not paint over existing markings. Remove pavement markings to the fullest extent possible without materially damaging the pavement surface, color, or texture. Group adjacent markings together into a larger rectangular removal area in conformance with FAA AC 150/5340-1, paragraph 1.3.f. and Figure 1-1, Figure 1-2, Figure 1-3 and Figure 1-4. Collect and dispose of all loose or waste material as needed to prevent interference with drainage or to prevent dusty conditions under traffic, wind, or propellers.

METHOD OF MEASUREMENT

620-4.1 RUNWAY AND TAXIWAY PAINTING BY UNIT AREA. If runway and taxiway painting by unit area appears in the bid schedule, then new painted markings will be so measured.

620-4.2 REFLECTIVE MEDIA. If reflective media by unit weight appears in the bid schedule, then this material will be so measured.

620-4.3 RUNWAY AND TAXIWAY PAINTING BY LUMP SUM. If a lump-sum item appears in the bid schedule, new painted markings will not be measured for payment. In this case, reflective media (glass beads) as indicated on the plans are subsidiary to the item.

620-4.4 PAINTED MARKING REMOVAL. Painted marking removal will be measured by area acceptably completed with the following exception. If painted marking removal is absent from the bid schedule, no measurement will be made and this item will be subsidiary to painting.

BASIS OF PAYMENT

620-5.1 Payment will be made at the respective contract unit or lump sum price for the pay items listed below that appear in the bid schedule.

Payment will be made under:

Item P-620c	Runway and Taxiway Painting – per lump sum
Item P-620f	Painted Marking Removal – per lump sum
Item P-620h	Roadway Painting – per lump sum

TESTING REQUIREMENTS

ASTM C371	Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders
ASTM D92	Flash and Fire Points by Cleveland Open Cup
ASTM D711	No-Pick-Up Time of Traffic Paint
ASTM D968	Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Epoxy Content of Epoxy Resins
ASTM D2074	Total Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Rubber Products-Durometer Hardness
ASTM G53	Operating Light and Water-Exposure Apparatus (Florescent UV-Condensation Type) for Exposure of Nonmetallic Materials.
Federal Test Method	Paint, Varnish, Lacquer and Related Materials; Methods of Inspection,

Standard No. 141 Sampling and Testing

MATERIAL REQUIREMENTS

Alaska DOT/PF and Yellow	Traffic Paint - No-Heat Instant Dry Pavement Marking Material; White
ASTM D476	Titanium Dioxide Pigments
Code of Federal Regulations	40 CFR Part 60, Appendix A, 29 CFR Part 1910.1200
Code of Federal Regulations	29 CFR Part 1910.1200 – Hazard Communications
Commercial Item Description (CID) A-A-2886B	Paint, Traffic, Solvent Based
Fed. Spec. TT-B-1325	Beads (Glass Spheres) Retroreflective
Fed. Spec. TT-P1952E	Paint, traffic and Airfield Marking, Waterborne
Federal Standard 595	Colors used in Government Procurement

ITEM P-650 AIRCRAFT TIE-DOWN

DESCRIPTION

650-1.1 This item consists of furnishing and installing aircraft tie-down anchors according to these specifications and the details on the Plans, or as directed by the Engineer.

MATERIALS

650-2.1 GENERAL.

Meet the strength and/or capacity requirements of this section for the type of anchor specified.

Substitution of products as approved equals will be determined by comparing ratings for tensile breaking strength and pull-out capacity that exceed the specified minimums when installed under prevailing soil or rock conditions. The practicality of installing proposed anchors at the plan locations and corrosion resistance will also be considered.

Tie-downs shall conform to the specifications and drawings. Mooring eye shall be Neenah R-3490 or approved equal. Concrete shall be in accordance with P-610.

650-2.2 CONCRETE ANCHOR TIE-DOWNS.

- a. Concrete Anchor 5,000 lbs. Provide an anchor assembly with a minimum tensile breaking strength of 9,000 pounds, a minimum working load capacity of 3,500 pounds and a minimum field pull-out capacity of 5,000 pounds.
- b. Concrete Anchor 10,000 lbs. Provide an anchor assembly with a minimum tensile breaking strength of 18,000 pounds, a minimum working load capacity of 7,000 pounds and a minimum field pull-out capacity of 10,000 pounds.

CONSTRUCTION METHODS

650-3.1 GENERAL. Concrete Anchor and Mooring Eye shall be installed as shown on the Plans.

The Concrete anchor tie-down may be cast in place or pre-formed and installed.

650-3.5 MANUFACTURER'S CERTIFICATION AND ACCEPTANCE TESTING. For anchors where minimum tensile breaking strength or working load capacity is specified, provide manufacturer's certification that requirements are met. For anchors where minimum field pull-out capacities are specified, provide an Engineer approved testing apparatus that can apply and measure the required minimum field pull-out capacity. Field test each anchor and certify each test by recording the date of the test, the force applied, and the person completing the test. Tabulate this data and deliver to the Engineer within 24 hours of completing the tests.

METHOD OF MEASUREMENT

650-4.1 By each set, consisting of 3 anchors, completed and accepted in final position.

BASIS OF PAYMENT

650-5.1 Payment will be made at the contract unit price for each set 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-650e(1) Concrete Anchor, 5,000 lbs. – per each
- Item P-650e(2) Concrete Anchor, 10,000 lbs. – per each

ITEM P-660 RETROREFLECTIVE MARKERS AND CONES

DESCRIPTION

660-1.1 Furnish and install 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 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.

CONSTRUCTION REQUIREMENTS

660-3.1 Install 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 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-660b Reflective Marker, Type II – per each

ITEM P-661 STANDARD SIGNS

DESCRIPTION

661-1.1. Furnish and install standard signs. The location and type of installation will be as shown on the plans or as designated.

MATERIALS

661-2.1 Use materials that conform to the following:

- a. **Sheet Aluminum.** Use alloy 6061-T6, 5052-H36, 5052-H38, or recycled aluminum meeting alloy 3105, as specified in ASTM B 209. Meet the thickness of aluminum sheet designated on the plans. Verify alloy and temper designations by mill certification.

Treat the aluminum base metal sheets with chromate conversion coating for aluminum to meet ASTM B 449, Class 2. Handle the cleaned and coated base metal only by a mechanical device or by operators wearing clean cotton or rubber gloves. After cleaning and coating operations, protect the panels at all times from contact or exposure to greases, oils, dust or other contaminants.

Make each sign panel a continuous sheet for all lengths 72 inches or less in the horizontal direction. Use no more than one vertical splice for signs up to 144 inches in length and 48 inches or less in height.

Meet the panel dimensions specified with a tolerance of 1/16 inch. Furnish metal panels that are cut to size and shape and free of buckles, warp, dents, cockles, burrs and any other defects resulting from fabrication. Complete all possible fabrication, including shearing, cutting and punching of holes prior to the base metal preparation.

- b. **Reflective Sheeting.** Meet AASHTO M 268, for the type specified.
- c. **Sign Posts.** Use the type and size of posts designated on the plans.

(1) Perforated Steel Posts.

Fabricate posts from 0.105-inch thick cold-rolled carbon steel sheets, commercial quality, to meet ASTM A 653 and ASTM A 924. Zinc coat, both sides, to meet coating designation G90. Form posts into a steel tube, roll to size, and weld in the corner.

Perforate all members for their entire length with 7/16-inch diameter holes on 1-inch centers.

Furnish members that are straight and with a smooth, uniform finish, with no splices.

Ensure that all perforations and cut off ends are free from burrs.

Ensure that consecutive sizes will telescope freely with a minimum of play.

- d. **Sign Fabrication.** Use Type IV reflective sheeting (for lettering, symbols, borders, and background) on sheet aluminum panels.
- e. **Sign Posts and Bases.** Use sign posts and bases of the types specified. The structural aspects of design and materials for sign supports must comply with the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. Do not splice sign posts.

Use commercial grade concrete for sign foundations with a minimum 28-day compressive strength of 2,500 psi or an approved, pre-mixed, sacked concrete.

CONSTRUCTION REQUIREMENTS

661-3.1 Attach sign panels to posts using the types and sizes of fastening hardware shown on the plans.

All materials and finished signs are subject to inspection and acceptance in place.

- a. Surfaces exposed to weathering must be free of defects in the coating that impair serviceability or detract from general appearance or color match.
- b. Finished signs must be clean and have no chatter marks, burrs, sharp edges, loose rivets, delaminated reflective sheeting, or aluminum marks. Do not make repairs to the face sheet.

Install breakaway assemblies according to the manufacturer’s written instructions.

Remove and replace all foundations requiring more than three shims to plumb a post without extra compensation.

Construct the top of any foundation located on a slope so that the finished slope passes through the top center of the foundation. Grade the area 24 inches up and down slope of the foundation edge so that no portion of the foundation projects above the surrounding slope and water will drain away from the foundation.

Attach a label to the back of all standard signs in the lower right corner. Make the label at least 15 square inches and show the year the sign was purchased from the manufacturer. Show the last two digits of the year in clear and bold numbers. Make the label from Type I or brighter reflective sheeting. Use background and legend colors meeting Table 661-1.

**Table 661-1
DECAL COLORS**

YEAR	BACKGROUND COLOR	LEGEND COLOR
XXX1	Yellow	Black
XXX2	Red	White
XXX3	Blue	White
XXX4	Green	White
XXX5	Brown	White
XXX6	Orange	Black
XXX7	Black	White
XXX8	White	Black
XXX9	Purple	White
XXX0	Strong Yellow-Green	Black

Central values and tolerance limits for each color, as referenced in the MUTCD, are available from the Federal Highway Administration, (HHS-30), 400 7th St. SW, Washington, D.C. 20590

661-3.2 Sign Placement And Installation. Sign locations are approximate and subject to field adjustment by the Engineer.

Do not allow the top of the embedded steel tube to extend more than 2 inches above the surrounding ground and concrete foundation.

On all signs, install 2-inch diameter wind washers, colored to match the sign face, between the fastener head and the sign. Use rust-resistant washers fabricated from a material equal in strength to the sign blank.

METHOD OF MEASUREMENT

661-4.1 By the total area of legend-bearing sign panel erected in place. No deductions in quantity for corner rounding will be made. Nominal dimensions for sign sizes indicated on the plans will be used to calculate sign pay quantities. Octagons and round signs will be measured as rectangles.

BASIS OF PAYMENT

661-5.1 Payment will be made at the contract price per unit of measurement. Sign posts, bases, mounting hardware, and concrete used for sign bases are subsidiary.

Payment will be made under:

Item P-661a Standard Sign – per square foot

ITEM P-670 HAZARDOUS AREA BARRIERS

DESCRIPTION

670-1.1 Provide barriers for use on the project under subsection 70-09, Barricades, Warning Signs and Hazard Markings. Provide each barrier complete with flasher unit and flag in accordance with the dimensions, design, and details shown on the Plans. Haul and place barriers as shown on the Plans or as directed by the Engineer. Relocate barriers as conditions warrant.

When used during periods of darkness, such barricades, warning signs and hazard markings shall be suitably illuminated. Barricades shall be spaced not more than 25 feet apart.

Provide additional flasher units and flags, when specified, for use on Owner-supplied barriers.

MATERIALS

670-2.1 Use materials that conform to the following:

- a. **Hazard Marker Barrier, Timber.** Provide construction-grade Douglas Fir-Larch with nominal dimensions of 12 inches x 12 inches and a length of 8 feet. Use pressure treated wood with a preservative salt retention of not less than 0.6 lbs/ft³, kiln dried after impregnation, and conforming to the American Wood Preservers Bureau (AWPB) FDN Standard. Provide timbers that bear the AWPB Quality Mark of an approved inspection agency as described in the AWPB Standard. Use either oil base or latex exterior paint in colors international orange and white.
- b. **Hazard Marker Barrier, Plastic.** Provide 10 inch x 10 inch by 8 foot nominal dimension portable water-ballast barriers made from high impact, safety orange and white, UV-resistant, high density polyethylene (HDPE) plastic. Provide barriers with pre-molded flag staff and flasher bracket attachment holes. Provide barriers that are designed as a modular system to allow assembly/disassembly and nesting for compact storage, and to permit the option of physically bolting multiple barriers together to provide a continuous barrier wall. Provide 6-inch x 72-inch reflective striping panel for attachment to one side of each barrier.

670-2.2 Flag. Provide heavy vinyl coated nylon, 18 inch x 18 inch flag with an integral diagonal metal or plastic stay to make the flag self-supporting. Provide flag in color fluorescent orange and mounted on a ¾ inch x 30-inch staff.

670-2.3 Flasher Unit. Provide battery-operated omnidirectional flashing red light. Provide flasher unit with mounting bracket designed for the appropriate barrier type.

- a. **Flasher Unit for Timber Barrier.** Meet Manual on Uniform Traffic Control Devices (MUTCD) requirements for Type A Warning Lights. Supply one set of non-standard tools, such as the on/off switch or battery access tool, for each 5 flasher units furnished.

Flasher Unit for Plastic Barrier.

Composition	High impact, polycarbonate plastic lens and base
Flashing Rate	60 flashes per minute
Brightness	6000 mcd
LED	Total of 3 red
Photo Cell	Allows for solar light to automatically shut off in higher level light conditions and turn on in lower light conditions

CONSTRUCTION REQUIREMENTS

670-3.1 GENERAL. On the top side and at opposite ends of each barrier, mount one flag and one flasher unit per manufacturer's instructions. Tether flag to the barrier.

a. Hazard Marker Barrier, Timber.

- (1) **Preparation.** Prior to painting, notch the underside of each timber to allow for the use of a forklift. Cut two 4 inch high by 12 inch wide notches spaced 36 inches center to center, centered on the long axis of the timber.
- (2) **Painting.** Apply one coat of primer and one coat of finish white color paint on all sides and the ends followed by two coats of orange finish paint to form the stripes on the sides. Paint orange stripes 24 inches wide and offset by 6 inches from one side to the next giving a "barber pole" effect.
- (3) **Flag and Flasher Unit.** Mount the flag 24 inches from one end of the timber by drilling a hole 1/8 inch larger than the diameter of the staff by 8 inches deep. Mount the flasher unit 24 inches from the opposite end of the timber.

b. Hazard Marker Barrier, Plastic. Fill barriers with water for ballast in accordance with manufacturer's recommendations. When shown on the plans or directed by the Engineer, interlock barrier units using manufacturer recommended connectors to form a continuous wall separating the hazardous work area from aircraft movement areas. Adhere reflective striping panels to one side of each barrier.

670-3.2 DELIVERY. Deliver hazard marker barriers, flasher units, and flags to the project site prior to commencing work within the Air Operations Area.

670-3.3 STORAGE. Following completion of the project, remove flasher units and flags from the barriers. Barriers, flasher units, and flags are the property of the State. Drain plastic barriers. Deliver to a location on the Airport designated by the Engineer.

METHOD OF MEASUREMENT

670-4.1 Hazard marker barriers, complete with flag and flasher unit will be measured by the number of units furnished and accepted.

Flasher units and flags to be used on Owner-supplied barriers will be measured by the number of units furnished and accepted.

BASIS OF PAYMENT

670-5.1 Payment covers all costs associated with furnishing and storing hazard marker barriers, flasher units, and flags, including tools, batteries, and incidentals.

Work required for placing, erecting, moving, and maintaining barriers is subsidiary.

Payment will be made under:

Item P-670a Hazard Marker Barrier, Plastic - per each

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 below.

Meet the applicable requirements of the State of Alaska Seed Regulations, 11 AAC 34, Articles 1 and 4.

Meet or exceed 90% pure seed and 85% 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. Seed certificates shall be removed from bags on site and submitted to the Engineer prior to installation. 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 REVEGETATION SEED MIX. Conform to the following:

Schedule - A Revegetation Seed Mix

<u>Name</u>	<u>Proportion By Weight</u>	<u>Purity</u>	<u>Germination</u>
Arctared Fescue (Festuca rubra)	90%	90%	85%
Annual ryegrass (Lolium multiflorum)	10%	90%	85%

901-2.3 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 below the Special Provisions. Use either of the following methods:

Apply seed uniformly at a rate of 153 lbs per acre. Apply fertilizer uniformly over the area to be seeded at a rate of 500 pounds per acre.

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. 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.

901-3.5 FINAL ACCEPTANCE. 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 square yard.** By the area of ground surface acceptably seeded, fertilized, and maintained. Required reseeding is subsidiary.

BASIS OF PAYMENT

901-5.1

Mulching will be measured and paid for under Item T-908.

Seeding by the Acre. Payment is for established vegetative matt. Soil preparation, fertilizer, and water required for hydraulic method are subsidiary.

Seeding by the Pound. Payment is for established vegetative matt. Soil preparation, fertilizer, and water required for hydraulic method are subsidiary.

Water for Seeding. Water applied for growth of vegetative matt. Water for hydraulic seeding, fertilizing, or mulching is subsidiary. Water after project completion is subsidiary.

Payment will be made under:

Item T-901a	Seeding - per acre
Item T-901c	Water for Maintenance - per M-gal

ITEM T-905 TOPSOILING

DESCRIPTION

905-1.1 This item shall consist of preparing the ground surface for topsoil application, removing topsoil from designated stockpiles or areas to be stripped on the site or from approved sources off the site, and placing and spreading the topsoil on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the Engineer.

MATERIALS

905-2.1 TOPSOIL. Furnish a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials and reasonably free from roots, clods, hard clay, noxious weeds, tall grass, brush sticks, stubble or other litter, and which is free draining and non-toxic.

The gradation shall conform to selected Class in Table 1 when tested according to ATM 304. If no class is indicated, meet the grading requirements in Table 1 for Class A topsoil.

TABLE 1. TOPSOIL GRADING

Sieve Designation	Percent Passing By Weight	
	CLASS A	CLASS B
3 in.	-	100
1/2 in.	100	-
No. 4	95-100	75-100
No. 16	64-90	50-95
No. 200	30-60	20-80
Organic Matter	10-40	5 min.

Percent of organic matter will be determined by loss-on-ignition of oven dried samples using ATM 203.

When necessary, amend natural topsoil to meet the above specifications, using approved materials and methods.

905-2.2 SALVAGED TOPSOIL. Salvaged topsoil consists of the top 4" to 12" of soils, as referenced vertically from the undisturbed area and newly constructed safety area, and broken-up vegetation derived from the project footprint. The project footprint includes the areas which shall be excavated or covered by fill as part of construction operations. Do not substitute material derived from deeper segments, or material from outside of the project limits without approval of the Engineer. Use topsoil that is free from construction wastes, petroleum byproducts, trash or other manmade materials. Break the vegetation into pieces less than 12" in the longest direction. Mechanically process the removed topsoil and surface vegetation to separate material that does not pass through a screen with 12" square openings.

CONSTRUCTION METHODS

905-3.1 PREPARING THE GROUND SURFACE. Where grades in the areas to be topsoiled have not been established, smooth-grade the areas to the grades shown on the Plans. Maintain the prescribed grades in an even and properly compacted condition to prevent the formation of low places or pockets where water will stand.

Clear the surface of the area to be topsoiled of all stones larger than 2 inches in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting.

Immediately prior to dumping and spreading the topsoil, loosen the surface, by approved means, to a minimum depth of 2 inches to facilitate bonding of the topsoil to the covered subgrade soil.

905-3.2 OBTAINING TOPSOIL. Prior to the stripping of topsoil from designated areas, remove any vegetation, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, using approved methods.

When suitable topsoil is available on the site, remove this material from the designated areas to the depth directed. Spread the topsoil on areas already tilled and smooth-graded, or stockpile in approved areas. Grade the stockpile sites and adjacent areas which have been disturbed if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, locate and obtain the supply, subject to approval. Notify the Engineer sufficiently in advance of operations in order that necessary measurements and tests can be made. Remove the topsoil from approved areas and to the depth as directed. Haul the topsoil to the site of the work and stockpile or spread as required.

905-3.3 PLACING TOPSOIL. Spread the topsoil evenly on the prepared areas to a uniform depth of 4 inches after compaction. Do not spread when the ground or topsoil is frozen or excessively wet.

After spreading, break up any large stiff clods and hard lumps with a pulverizer or other effective means. Rake up and dispose of all stones or rocks (2 inches or more in diameter), roots, litter, or any foreign matter. After spreading, compact the topsoil with a cultipacker or by other approved means. The compacted topsoil surface shall conform to the required lines, grades, and cross sections. Promptly remove any topsoil or other dirt falling upon pavements or other surface courses.

Track topsoil with a dozer to make track marks running perpendicular to the direction of drainage.

METHOD OF MEASUREMENT

905-4.1 By the square yard, according to Subsection GCP-90-02, acceptably placed.

BASIS OF PAYMENT

905-5.1 Payment will be made at the contract unit price per square yard.

Stockpiling and rehandling of topsoil are subsidiary.

Payment will be made under:

Item T-905a Topsoiling - per square yard

TESTING REQUIREMENTS

ATM 304 Sieve Analysis of Aggregates & Soils

ITEM U-100 WATER SYSTEM

DESCRIPTION

100-1.1 This item includes providing all labor, materials, tools and equipment necessary for furnishing and installing buried water pipe and fittings, thrust blocks and restraints, tie rods, electrical continuity, fire hydrants, gate valves, valve risers, water services, disinfection and testing. The Contractor shall install the water pipe and fittings to the horizontal and vertical alignment shown on the Drawings and shall complete all associated work described in this Section. Comply with the latest City & Borough of Juneau (CBJ) Standard Specification and Standard Detail requirements.

100-1.2 SUBMITTALS.

The required submittals for this work will be: water pipe, material specifications, gate valves, fire hydrants, service saddles, corporation stops, curb stops, service boxes, blow off hydrant and fittings: material specifications and catalog cut sheet(s).

MATERIALS

100-2.1 BEDDING MATERIAL

- a. **Bedding.** Class A bedding shall be aggregate conforming to the following gradation:

Sieve Designation	Percent Passing by Weight
1-1/2"	100
No. 4	0-35
No. 200	0-8

Bedding material for pipe placement shall be non-frost susceptible material.

- b. **Backfill.** Use approved materials as shown on the Drawings and in accordance with Item D-701-3.5.

100-2.2 PIPE

Use materials that conform to the following:

- a. Water Pipe shall conform to the latest CBJ Standard Specifications and Standard Details requirements.

Where shown on the drawings, use high density polyethylene (HDPE) pipe and fittings that meet the following:

Where shown on the Drawings, use high-density polyethylene (HDPE) pipe and fitting that meet the following: High Density Polyethylene (HDPE) pipe shall be produced with approved bimodal PE 3408 / PE 100 / PE 4710 listed resins. The resin shall be DOW Continuum DGDC 2480K, High Density Polyethylene – PE 100 / PE 4710, or approved equal. The pipe shall have a minimum pressure rating of 160 pounds per square inch, and a Standard Dimension Ratio (SDR) of 11. All HDPE water pipe shall have a standard iron pipe size (IPS) outside diameter.

1. The pipe and fitting material shall have a cell classification of 445574 in accordance with ASTM D3350.
2. Compounds shall have a PPI recommended Design Basis (HDB of 1,600 psi at 68°F (20°C). Compounds shall have a PPI recommended HDB of 1,000 psi at 176°F (80°C).

3. Slow Crack Growth Resistance shall be measured in accordance with ASTM F1473 (PENT). The minimum required time to failure shall be 4,000 hours.

Ductile Iron Pipe (DIP) shall conform to the requirements of the AWWA C151, with cement mortar lining conforming to the requirements of AWWA C104. Water pipe shall have an exterior bituminous coating conforming to the requirements of AWWA C110. Standard thickness Class 52 pipe shall be used unless otherwise shown on the Drawings. All water pipe shall be clearly marked with the manufacturer's name, type, class and/or thickness as applicable and be legible.

b. Joints

1. HDPE pipe shall be joined in continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the manufacturer's recommendations.
2. Flange and mechanical joint adapters shall be attached to the HDPE pipe and fittings using butt fusion. Align and center the flange or mechanical joint adapter relative to the pipe. Flanges and mechanical joint adapters shall be square with the receiving valve or other flange before tightening of bolts. Bolts shall not be used to draw the flanges into alignment. Bolt threads shall be lubricated and flat washers shall be used under flange nuts. Bolts shall be tightened in accordance with the manufacturer's recommendations. All bolts and associated hardware shall be stainless steel. The tightening torque shall be as indicated by the manufacturer. Gasket material shall conform to NSF 61.
3. DIP placed within pipe casings shall have restrained joint connections. Refer to CBJ Standard Detail 413 – Bored Encasement.
4. Restrained joint DIP pipe shall be U.S. Pipe TR FLEX, U.S. Pipe field Loc Gasket, EBBA IRON "Mega-lug System," Griffin Snap Lock, Pacific State Lock Mechanical type, or approved equal. Restrained push-on joints for pipe shall be designed for a water working pressure of 250 psi and shall be capable of being deflected a minimum of 3° per joint, for pipe sizes through 18 inches, after assembly.

c. Fittings

1. Fittings for all ductile iron water pipe and restrained joint ductile iron water pipe shall be U.S. Pipe TR FLEX, push-on gasket fittings compatible with U.S. Pipe Field Loc Gasket, mechanical joint fittings with EBBA IRON "Mega-lug System" Griffin Snap Lock, Pacific State Lock Mechanical Type, or approved equal.
2. For connecting to existing water mains, the Contractor shall use a mechanical joint tee and a mechanical joint cutting-in-sleeve similar to Clow F-1220 or Mueller H-843, or a cast iron coupling similar to Rockwell 431, or approved equal. The length of all sleeves and couplings shall equal or exceed the diameter of the pipe.
3. All valve clusters consisting of a tee or cross and one or more valves, including fire hydrant legs, shall be monolithically restrained with EBBA Iron "Mega-lug System," or approved equal.

100-2.3 LUBRICANT

- a. The lubricant shall be suitable, and acceptable by the manufacturer and the CBJ Water Utility for lubricating the parts of the joint for assembly. The lubricant shall be non-toxic "industrial food grade", shall not support the growth of bacteria, and shall have no deteriorating effects on the gasket material. It shall not impart taste or odor to the water in a pipe that has been flushed in accordance with AWWA C601, "Standard for Disinfecting Water Mains". The lubricant containers

shall be labeled with the trade name or trademark and the pipe manufacturer's name where applicable.

100-2.4 TRACER WIRE

- a. Install tracer wire on all water pipe per manufacturer's recommendations. Tracer wire shall be installed in continuous lengths with no splices. Terminate each end of tracer wire at a valve box, or furnish and install a valve box top section and cap for termination. Terminate tracer wire at ground surface and provide a minimum of five (5) feet of additional wire neatly coiled within valve box. The trace wire shall be tested for continuity following all backfilling operations.

100-2.5 THAW WIRE

- a. Thaw wire and continuity straps shall be No. 2 copper wire, stranded, with THW insulation or equal. Exothermic welding to attach continuity straps on DIP and fittings shall be "Cadweld" or approved equal and coated with bituminous coating.

100-2.6 UNDERGROUND MARKING TAPE

- a. Underground marking tape shall be blue, six inch wide, four mil thick, polyethylene tape with black lettering with the following wording: "Caution: Waterline Buried Below." Marking tape shall be installed 12 inches above the top of all water pipe.

100-2.7 TIE RODS

- a. Tie rods shall be threaded black iron or mild steel with a 12-mil minimum asphaltic coating and shall be located symmetrically around the perimeter of the pipe using anchorage lugs of standard manufacture for attachment where required. Unless otherwise shown on the Drawings, the number and size of the rods shall be as shown on the table below:

PIPE SIZE	TIE ROD SIZE	NUMBER OF RODS
4" – 10"	¾"	2
12" – 16"	¾"	4
18" - 20"	¾"	6
22"	1"	4
24"	1"	6

100-2.8 GATE VALVES.

- a. Gate valves for water pipes 12 inches and smaller shall be of the iron body, non-rising bronze stem, resilient-seated wedge-type. Valve shall be American AVK Company, Kennedy, M & H, or Mueller and shall meet or exceed the requirements of AWWA C509 and the specific requirements outlined in these Specifications.
- b. Gate valves shall open counter-clockwise and be provided with two inch square wrench nuts, except that when installed within vault structures a hand wheel shall be provided for each valve.
- c. End connections shall be mechanical joint, unless otherwise indicated on the Drawings.
- d. All internal ferrous metal surfaces shall be fully coated, holiday free, to a minimum thickness of four mils with a two part thermosetting epoxy coating. Said coating shall be non-toxic, impart no taste to water, protect all seating and adjacent surfaces from corrosion and prevent buildup of scale or tuberculation.
- e. Gate valves, when attached to a restrained joint, shall have tie rods and one retainer gland for each joint. The size and number of tie rods shall conform to the requirements of this Section and CBJ Standard Drawings 414A through 414C.
- f. The Contractor shall provide four detailed repair manuals for the gate valves supplied; and a letter of certification from the supplier verifying that all requirements of AWWA C509 and these Specifications have been met.

- g. The Contractor shall provide one standard packing kit for every group of ten (and fraction thereof) of each size of gate valve.
- h. All resilient seat gate valves 6 inch and smaller are required to have a thaw wire either bolted or cad welded to the valve body, and raised through the inside of the valve box, therefore making it available for both continuity testing, and thawing. An additional thaw wire will still need to be attached to the main, and coiled around the outside of the box according to the current standard details

100-2.9 VALVE BOXES.

- a. The Contractor shall furnish the specific style box, stem, and cover. Adjust existing valve boxes to profile grade. Inscribe cover with "water" or "W". Furnish service box of sufficient length to be adjusted an equal amount above and below the final ground surface. Valve boxes for valves four inches or larger shall be of cast iron and be not less than 5¼-inch diameter, with an extension piece adjustable for elevation and with a cover marked "Water" or "W." The valve box shall be sufficient length to be adjusted and equal amount above and below the finished grade as shown on the Standard Details. Boxes shall be dipped in coal tar pitch. The valve box base section shall be an East Jordan Iron Works 8555 30-B or 36-B slide valve box bottom section, or approved equal. The valve box top section shall be an East Jordan Iron Works 8555 Slide 26T, 16T, or 10T valve box top or approved equal.
- b. Utility Markers Utility markers for water valves shall be "Utility Marker CUM-375" as manufactured by Carsonite Division of AMETEK, blue in color, six feet in length including anchor kits and decals with each marker. Decals shall denote "WATER VALVE."

100-2.10 FIRE HYDRANTS.

- a. Fire hydrants shall conform to the requirements of AWWA C502 for Dry Barrel Fire Hydrants. Fire hydrants shall be: Mueller Centurion 200 or 250, with Integral Storz Pumper Connection, Waterous 5-1/4 inch Pacer, Dresser M & H Style 929 or Engineer approved Equal.
- b. Fire hydrants shall be supplied with a main valve seat ring threaded into a bronze bushing. Fire hydrants shall be three-way and furnished with two 2-1/2-inch hose nozzles and one 5-inch pumper nozzle. The pumper nozzle shall be one-piece design, compatible with 5-inch Storz hose coupling.
- c. Fire hydrants shall be furnished with a six inch ASA Class 125 standard mechanical-joint inlet with two cast-on lugs for tie backs.
- d. Fire hydrants shall be provided with a weather cap and an epoxy or bituminous-coated shoe.
- e. Connections shall be mechanical joint with "Mega-lug" fittings, unless otherwise indicated on the Drawings.
- f. Fire hydrants shall be three-way and furnished with two 2-1/2 inch hose nozzles and one 5-inch pumper nozzle. The pumper nozzle shall be one-piece design, compatible with 5-inch Storz hose coupling. The nozzle shall be an integral part of the fire hydrant assembly, resistant to tamper or removal by persons not familiar with the art of fire hydrant construction. Add-on Storz compatible adapters shall not be acceptable.
- g. Fire hydrants shall be left hand opening (counter clockwise). Operating and nozzle nuts shall be National Standard pentagonal with weather cap. Hose nozzle threading shall be in conformance with NFPA No. 194 for national (American) Standard Fire Hose Coupling Screw Threads
- h. Unless otherwise required by the Drawings, fire hydrants shall be furnished with a barrel length that will allow a five foot bury.
- i. The main hydrant valves shall be of the compression type where water pressure holds the main valve closed permitting easy maintenance or repair of the entire barrel assembly from above the ground without the need of a water shut-off. The main valve seat shall be an ether glycol urethane compound, or approved equal, that is abrasion and gravel resistant.
- j. Fire hydrants shall be furnished with a breakaway traffic flange of the type which allows both barrel and stem to break clean upon impact from any angle. Traffic flange design must be such that repair and replacement can be accomplished above ground.

- k. All working parts shall be bronze or non-corrosive metal in accordance with the requirements of AWWA C 502.
- l. Painting and coating shall be in accordance with applicable AWWA specifications. After installation, the fire hydrant section from the traffic flange to the top of the operating nut shall be painted "OSHA Yellow," with wording stenciled in black. Refer to CBJ Standard Detail 403 – Fire Hydrant.
- m. Electrical thaw wire and continuity straps shall be No. 2 copper wire with THW insulation, and shall be connected with bolts with double nuts, to the tee at the main.
- n. Flag assemblies shall be Flexi-Flag Assembly by Nordic fiberglass, Inc., or approved equal.
- o. The Contractor shall provide the following spare parts for every group of ten (and fraction thereof) of Fire Hydrant Assemblies installed on the Project:
 - (a). Break Flange Repair Kit One each
 - (b). Valve Seat Rubber One each
 - (c). Cover Gasket One each
 - (d). O-Rings One set

100-2.11 HYDRANT ACCESS PADS

- a. Hydrant access pads shall be constructed in conformance with the CBJ Standard Detail 405 – Hydrant Pad as shown, or as described in the drawings.
- b. Corrugated Metal Pipe (CMP) shall comply with the requirements of CBJ section Storm Drains and Culverts.
- c. Rigid Board Insulation shall comply with Requirements of CBJ section Pipe Insulation.
- d. Asphaltic concrete paving shall be furnished in accordance with specifications for Plant Hot Mix Asphalt.

100-2.12 BARREL EXTENSIONS

- a. Barrel extensions shall conform to the requirements of AWWA C502 for Dry Barrel Fire Hydrants and shall include barrel extension, steel stem coupling, stainless steel clevis and cotter pins, solid flange, gasket, bolts and nuts, stem extension and lubricant.

100-2.13 WATER SERVICES

- a. Service Saddles shall be designed for a minimum 250 psi working pressure and shall conform to the following requirements:

PIPE SIZE	SERVICE SIZE	SERVICE SADDLE
6" and 8"	1"	Single Strap, Stainless Steel, I.P. Thread Romac 101N or approved equal
6" and 8"	1 ½" and 2"	Double Strap, Stainless Steel, I.P. Thread Romac 202N or approved equal
10" thru 18"	¾" thru 2"	Double Strap, Stainless Steel, I.P. Thread Romac 202N or approved equal

- b. Corporation stops shall be Mueller No. B-25025, McDonald Brass 4704B, or approved equal. Corporation stops shall be attached to the water pipe with cast iron service saddles.
- c. Water service pipe and materials shall be cold drawn, seamless annealed Type K Copper. Fittings for water pipe less than 2-inches in diameter shall be flared bronze fittings. Fittings for 2-inch pipe shall be bronze grip-lock compression fittings.
- d. Curb stops shall be Mueller No. H-15201, McDonald Brass 6100, or approved equal.
- e. Service boxes for curb stops shall be of cast iron and be not less than four (4) inch diameter with the extension piece adjustable for elevation and with cover marked "Water" or "W." The service

box shall be of sufficient length to be adjusted an equal amount above and below the finished grade as shown on the Standard Details. Boxes shall be dipped in coal tar pitch. Service boxes shall be Tyler Pipe 6870 Series, 4¼-inch ID, Kejriwal Pacific 145R 49-62, or approved equal. Wood foundation components shall be treated in accordance with AWPA Standards.

- f. Thaw wires shall be No. 2 copper wire, stranded, with THW insulation, or approved equal. Thaw wires shall be connected to the service saddle take-up with a solderless lug, Stak-On, or approved equal.
- g. Underground marking tape shall be blue, six inch wide, four mil thick, polyethylene tape with black lettering with the following wording: "Caution: Waterline Buried Below." Marking tape shall be installed 12 inches above the top of the water service pipe and blow-off lines.

100-2.14 CONCRETE

Provide commercial grade concrete for thrust and restraint blocking with a minimum 28-day compressive strength of 2,500 psi or an approved, pre-mixed, sacked concrete.

100-2.15 TEMPORARY WATER SYSTEM

All piping, including hoses used for water service, shall be NSF rated.

CONSTRUCTION REQUIREMENTS

100-3.1 GENERAL.

Complete the water system and make sure it operates properly at the time of acceptance of the work. Furnish and install all incidental parts not shown on the Drawings or specified in this section that are necessary to complete the water system.

Meet the applicable provisions of Item P-152 for excavation and Item D-710-3.5 for backfill.

Consult the Drawings for estimated locations of existing sewers, water mains, and other utilities near the construction. Use this data for general information only. The Department does not guarantee their accuracy. Confirm and mark the exact locations of all existing utilities before starting work. The Contractor shall preserve and protect all existing utilities and other facilities including but not limited to: telephone, television, electrical, water and sewer utilities, surface or storm drainage, highway or street signs, mail boxes, and survey monuments.

Excavate, bore, or probe by hand ahead of your work where necessary to determine the exact location of underground pipe or other features that might interfere with construction. Support and protect pipe or other services that cross the trench. Immediately replace any existing valves, valve boxes, or water lines that you break or damage.

The Contractor shall give at least 24 hours notice to the CBJ Water and Wastewater Utility Divisions and the CBJ Engineering Department prior to:

1. needing water or sewer main line locates;
2. interruption of water service in any area; or
3. use of water from any fire hydrant.

Any water service disruption shall be restored as soon as possible. The Contractor shall comply with the current policy on "Water and Sewer Line Locates" of the CBJ Public Works Department, Water and Wastewater Utilities Divisions. The Contractor shall notify all local radio stations and any major customers who will be affected of a planned water service disruption.

Notify the local Fire Department at least 24 hours before removing or interrupting service to fire hydrants.

Give at least 24 hours' notice before interrupting water service to any area. Restore disrupted water service as soon as possible, or make temporary service connections. Use hoses or other suitable methods. Obtain ADEC approval prior to installation of any temporary water service.

If your operations cause service interruptions, you are responsible for all damages.

Connect to existing water lines and structures, avoiding contamination of water in lines that are in use. Where water mains under this contract approach within 10 feet horizontal clearance and are below or less than 3 feet above existing sanitary sewers, encase the sanitary sewer with a jacket of concrete 3 inches thick for 10 feet on each side of the crossings.

Concrete encasement is not required if the existing sewer is constructed of ductile iron pipe with joints at least 8 feet from the water main, or if you replace the existing sewer with ductile iron pipe, or high pressure PVC pipe.

Support and protect existing pipes or utilities, which are not scheduled for removal or abandonment, when encountered in the excavation.

Remove and dispose of unsuitable foundation material below the designed elevation as directed. Replace with approved material. Remove rock or other unyielding material, when encountered, to the depth indicated or as directed and replace with approved material.

Place bedding and backfill in uniform layers not more than 6 inches deep and compact to meet the requirements specified in this Section. Ponding or jetting is not permitted.

Use bedding material for backfill to a level 12 inches above the pipe. Use excavated native material for the remainder of the backfill if it meets the requirements for backfill specified in Item D-710-3.5 Within the pavement structure, use bedding material and backfill meeting the requirements for the applicable lift of material.

Remove all sheeting and bracing used in structure excavation upon completion of the work.

100-3.2 WATER PIPE.

Install pipe and fittings according to these Specifications or the manufacturer's recommendations. Lay pipe to the grades and lines specified or as directed by the Engineer.

Water pipe shall be installed in accordance with the manufacturer's printed specifications and instructions, and in conformance with AWWA C151. The water pipe shall be handled carefully to prevent damage to the pipe, pipe lining, or coating. Water pipe and fittings shall be loaded and unloaded using hoists and slings to avoid shock or damage, and under no circumstances shall they be dropped, skidded, or rolled. If any part of the coating or lining is damaged, repair thereof shall be made in a manner satisfactory to the Engineer at the Contractor's expense.

All water pipe and fittings shall be inspected for defects. Damaged pipe will be rejected and the Contractor shall immediately place all damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours.

Remove all foreign matter from pipe interiors before lowering pipe into the trench. When work is not in progress, securely close all open ends of pipe and fittings to keep out trench water, earth, rodents or other substances.

Keep trenches dry to avoid laying pipe in water. Do not lay pipe when weather or trench conditions are unsuitable. Keep water away from new joints, until the joint materials have hardened.

Whenever it becomes necessary to cut a length of water pipe, the cut shall be made by abrasive saw or by special pipe cutter.

All pipe ends shall be square with the longitudinal axis of the water pipe and shall be reamed and smoothed to assure a good connection.

The water pipe shall be laid to the horizontal and vertical alignment shown on the Drawings. A minimum five foot cover shall be maintained from finish grade to top of water pipe, unless otherwise shown on the Drawings. Fittings shall be installed at the location shown on the Drawings.

To prevent dirt and other foreign material from entering the pipe and fittings during handling and installation, the open end of the pipe shall be protected by a water-tight plug at all times except when joining the next section of pipe.

Under no circumstances shall pipe deflections, either horizontal or vertical, exceed the manufacturer's printed recommendations. Where deflections would exceed the manufacturer's recommendations, fittings shall be used.

Vertical deflections to avoid obstructions that exceed allowable water pipe joint deflections shall be accomplished by the use of fittings and either joint restraints or vertical thrust blocking conforming to the Standard Details. Additional fittings to those indicated on the Drawings will be required to accomplish these vertical deflections.

Concrete thrust blocks shall be furnished and installed in accordance with the Drawings and Standard Details.

Pressurized water pipe ends shall be plugged and thrust blocks installed. Volume and bearing area of thrust blocks for end plugs shall be equal to applicable standards for bends greater than 4°. Existing water pipes and appurtenances to be removed or abandoned shall be as designated on the Drawings or directed by the Engineer. Abandoned water services shall be plugged at the cut ends. Abandoned water pipes shall be removed as shown on the Drawings, or mechanically plugged if not required to be removed.

All pipe fittings shall be restrained with EBBA Iron "Megalug System," or approved equal.

All joints within 50 feet of tees or bends equal to or greater than 22.5° shall be restrained joints.

Continuous water services shall be provided for all structures, except for interruptions necessary for connection of temporary or new piping to the existing service or mainline piping.

The Contractor is responsible for maintaining continuous water service at volume and pressure to match existing to all structures, with either existing, temporary or new piping, except as provided in this Section.

Place pipe bedding to conform to plan details. Place bedding, if required, to give pipe a uniform bearing for its full length. Do not permit couplings to rest on solid or original trench bottoms.

Pipe bends must not exceed the manufacturer's recommended limits. If the specified or required alignment requires deflections beyond the limits, furnish special bends or enough shorter lengths of pipe to provide angular deflection within the limits.

Use standard lengths of pipe except where fittings require short lengths, or where pipe passes through a rigid structure.

Make service and other connections as required. Valve, plug or cap pipe ends for future connections.

HDPE pipe shall be joined in continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the manufacturer's recommendations.

- (1) Flange and mechanical joint adapters shall be attached to the HDPE pipe and fittings using butt fusion. Align and center the flange or mechanical joint adapters relative to the pipe. Flanges and mechanical joint adapters shall be square with the receiving valve or other flange before tightening of bolts. Bolts shall not be used to draw the flanges into alignment.

Bolt threads shall be lubricated and flat washers shall be used under flange nuts. Bolts shall be tightened in accordance with the manufacturer's recommendations. All bolts and associated hardware shall be stainless steel. The tightening torque shall be as indicated by the manufacturer. Gasket material shall conform to NSF 61.

- (2) Only HDPE piping will be allowed for use.
- (3) Install tracer wire per manufacturer's recommendations. Tracer wire shall be installed in continuous lengths with no splices. Terminate each end of tracer wire at a valve box, or furnish and install a valve box top section and cap for termination. Terminate tracer wire at ground surface and provide a minimum of five (5) feet of additional wire neatly coiled within the valve box. The trace wire shall be tested for continuity following all backfilling operations.

Installation of ductile iron water mains and their appurtenances will follow ANSI/AWWA C600.

- (1) Fittings must be Class 52 ductile iron, unless otherwise specified. Fittings must conform to the requirements of AWWA C110/ANSI A21.10 or C153 A21.53-06.
- (2) Install tracer wire per manufacturer's recommendations. Tracer wire shall be installed in continuous lengths with no splices. Terminate each end of tracer wire at a valve box, or furnish and install a valve box top section and cap for termination. Terminate tracer wire at ground surface and provide a minimum of five (5) feet of additional wire neatly coiled within the valve box. The trace wire shall be tested for continuity following all backfilling operations.

100-3.3 GATE VALVES

Valves shall be inspected upon delivery in the field in both open and closed positions prior to installation. Careful inspection shall be made for injury to the outer protective coatings. At all places where the coating has been ruptured or scraped off, the damaged area shall be cleaned to expose the iron base, and then re-coated with two or more field coats of approved protective coating.

Valves shall be set on a firm base.

Valves shall be installed, in an open position, in the vertical plane passing through the pipe axis, in conformance with the manufacturer's recommendations and the AWWA Standards. Valve interiors shall be cleaned of all foreign matter.

After installation, all valves shall be subjected to field-testing and disinfected as outlined in this section 3.12 through 3.16. Should defects in design, materials, or quality of work appear during these tests, the Contractor shall remove and replace the valve, or correct such defects, with the least possible delay, to the satisfaction of the Engineer.

All valve clusters consisting of a tee and one or more valves, including fire hydrant legs, shall be monolithically restrained with EBBA Iron "Mega-lug System" fittings, or approved equal. Each connecting pipe to the valve cluster or tee will be restrained to the cluster or tee.

100-3.4 VALVE BOXES

A valve box shall be installed over each valve, with the base section centered over the valve and resting on well-compacted backfill. The top section shall be set to allow equal movement of the telescoping section above and below finished grade, as shown on the Standard Details, unless otherwise directed by the Engineer. The top of the base section shall be on line with the nut at the top of the valve stem and the entire assembly shall be perpendicular to the water pipe.

100-3.5 REPLACE VALVE BOXES

Replace Valve Boxes will include removal of the existing valve box down to the valve and replacing with a new valve box assembly conforming to 2.1(d) of this Section.

The new valve box shall be installed in accordance with 3.4 of this Section.

100-3.6 ADJUST EXISTING VALVE BOXES

Adjust by raising or lowering to conform to the final grade, in accordance with the locations and details shown on the Drawings. The existing case iron valve box and cover shall be salvaged and reused. Where the valve box is of the adjustable-type construction, it shall be adjusted with adaptable extension pieces. Where the valve box is constructed with steel pipe, additional steel pipe shall be welded to the valve box to raise the cover; lowering shall be accomplished by cutting the existing steel pipe.

Where the existing valve box is tilted and/or far enough off center on the valve nut to make valve operation difficult, the Contractor shall plumb and center the valve box over the valve nut prior to strengthening or placement of base course material.

100-3.7 UTILITY MARKERS

Utility markers for water valves shall be installed at main line valve boxes at locations indicated on the Drawings and as directed by the Engineer. The position of the marker shall be as shown on the detail drawing, or as directed by the Engineer.

100-3.8 FIRE HYDRANTS

The Contractor shall install the fire hydrant assemblies in accordance with applicable AWWA Standards, the manufacturer's recommendations and the CBJ Standard Details. The interior components of the fire hydrant shall be cleaned of all foreign matter prior to installation. Fire hydrant legs shall be installed level and the barrel shall be installed plumb. Any adjustments to the traffic flange shall be accomplished with barrel extensions, in accordance with the fire hydrant manufacturer's recommendations. The extensions shall be made between existing barrel and hydrant. Fire hydrants shall be tied back to the water pipe using tie rods. Stuffing boxes shall be tightened and the fire hydrants shall be opened and closed in the presence of the Engineer to see that all parts are in working condition.

Remove the hydrant drain plugs, if any, prior to installation.

The top cap on fire hydrants serviced from the high-pressure system shall be painted yellow.

Fire hydrants installed, but not available for use, shall be covered with burlap or heavy plastic and security tied.

Electrical continuity is required for fire hydrant assemblies. Electrical continuity tests shall be performed in accordance with this section.

After installation, all fire hydrant assemblies shall be flushed, field-tested, and disinfected as outlined in this section.

100-3.9 GUARD POSTS

Guard posts shall be installed where directed by the Engineer in accordance with the CBJ Standard Detail 404 – Hydrant Guard Posts. Guard posts shall not be installed in State of Alaska Department of Transportation and Public Facilities road right-of-ways.

100-3.10 HYDRANT ACCESS PADS.

Hydrant access pads shall be installed where directed by the Engineer in accordance with the CBJ Standard Detail 405 – Hydrant Pad, and as shown or described on the Drawings. Culvert size shall be noted on the Drawings.

100-3.11 WATER SERVICES

The corporation stop shall be installed directly to the service saddle. Water services shall be installed in conformance with the Standard Details. All water services shall be completely exposed and inspected for leakage by the Engineer prior to covering, and shall be pressure tested as approved in this section.

Service pipe shall be cut using a tool specifically designed to leave a smooth, even and square end on the pipe material. Cut ends shall be reamed to the full inside diameter of the pipe.

All service pipe and appurtenances shall be disinfected and flushed at the time of installation. The service line shall be activated at the corporation stop prior to backfilling and flushed through the curb stop. Electrical continuity tests shall be performed in accordance with this section after backfilling, compaction, and final grading are completed. If electrical continuity is not obtained, the Contractor shall excavate the service and re-establish continuity. Retesting will continue until continuity is established. All Work associated with electrical conductivity testing, retesting and performance is incidental to other items in this section.

Relocate Existing Water Service is a contingency item. If relocation of the service pipe is required, as determined by the Engineer, the existing pipe shall be cut or disconnected at one point only, so the coupling is not located within two feet of the crossing or other conflicting structures.

Thaw wires shall be placed over a 6-inch minimum layer of backfill so the thaw wire does not come in contact with copper tubing. When two or more services are placed in the same trench, thaw wires shall have a minimum 6-inch clearance between adjacent thaw wires.

Thaw wires shall be run into the service box near the top of box through a drilled hole large enough for the thaw wire. No cutting or notching of the service box will be permitted.

100-3.12 FLUSHING, TESTING AND DISINFECTION

Prior to acceptance, the Contractor shall "Open-Bore" flush the water pipe then perform hydrostatic tests, electrical continuity tests, and disinfection and coliform tests. Testing may be done in any sequence. However, in the event the disinfection, coliform and continuity tests have been performed and repairs are made to the water pipe system in order to pass the hydrostatic test, all previous tests and the "Open-Bore" flushing shall be repeated to the satisfaction of the Engineer.

100-3.13 OPEN BORE FLUSHING

Open bore flushing is required of all installed water pipes to remove any foreign matter. The Contractor shall furnish, install and remove all pumps, fittings and pipes necessary to perform the flushing; shall provide all additional excavation and backfill; and shall dispose of all water and debris flushed from the water pipe. Flushing through fire hydrants, reduced outlets or fittings shall not be permitted unless specifically authorized in writing by the Engineer. The Contractor shall notify the Engineer, in writing, 48 hours in advance of any flushing operation. All flushing shall be done between the hours of 1:00 a.m., and 5:00 a.m., unless otherwise authorized by the Engineer. A flushing scheme and schedule shall be submitted by the Contractor for review and approval by the Engineer prior to flushing. The schedule for flushing must be approved by the CBJ Water Utility Division. The Contractor shall be responsible for obtaining any permits necessary for flushing operations.

100-3.14 HYDROSTATIC TESTING

Hydrostatic testing will be conducted in the presence of the Engineer on newly installed water pipes after "Open-Bore" flushing, in accordance with the requirements of AWWA C600 and as stated hereafter. The Contractor shall furnish all assistance, equipment, labor, materials, and supplies necessary to complete the test to the satisfaction of the Engineer. The Contractor shall suitably valve-off or plug the outlet to existing or previously-tested water pipe prior to performing the required hydrostatic test. Prior to testing, all air shall be expelled from the water pipe. If permanent air vents are not available to accommodate testing, the Contractor shall install corporation stops and blow-off lines so the air can be expelled as the line is filled with water.

The hydrostatic pressure shall be a minimum of 150 psi or 1½ times the operating pressure of the water pipe (measured at the highest elevation of the newly-installed water pipe), whichever is greater, unless otherwise directed by the Engineer. Acceptance pressure testing shall be done with all service lines installed, corporation stops open, and pressure against the closed curb stops. The duration of each hydrostatic pressure test shall be one hour. Pumping will cease after the required test pressure has been reached. If the pressure remains constant for one hour without additional pumping, or pressure drop is less than five psi, that section of water pipe is acceptable.

If the pressure drops five (5) psi or more during the initial one hour hydrostatic pressure test, the Contractor shall conduct a leakage test. Leakage shall be determined by measuring "make-up" water necessary to restore the specified test pressure. The quantity of water lost from the water pipe shall not exceed the number of gallons per hour as determined by the following formula:

$$L = ND(P)0.57400$$

L = Allowable leakage in gallons per hour

N = Summation of mechanical and push-on joints in length of water pipe tested

D = Diameter of water pipe in inches

P = Test pressure in pounds per square inch

Should the tested section fail to meet the pressure test as specified, the Contractor shall locate and repair the defects and then retest the water pipe as specified above. Any specific leakage point detected shall be corrected by the Contractor to the satisfaction of the Engineer regardless of the allowable leakage specified above.

All tests shall be made with the auxiliary gate valves open and pressure against the hydrant. After the hydrostatic test has been successfully completed, each valve shall be tested by closing in turn and relieving the pressure beyond. This test of the valves will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Contractor shall verify that the pressure differential across the valve does not exceed the rated working pressure of the valve.

Sections to be tested shall be limited to 1,500 feet, unless otherwise approved in writing by the Engineer.

Defective materials or poor quality of work, discovered as a result of the hydrostatic tests, shall be replaced by the Contractor. Whenever it is necessary to replace defective material or correct the workmanship, the hydrostatic test shall be repeated until a satisfactory test is obtained.

The Engineer shall be present for all hydrostatic and leakage tests. The Contractor shall notify the Engineer at least 24 hours prior to any test and shall notify the Engineer at least two hours in advance of the scheduled time if the test is to be cancelled or postponed.

After completion of testing, all test and air vent pipe shall be removed and the corporation stop closed at the water pipe, in the presence of the Engineer.

For HDPE pipe, the initial pressure test shall be at 150 psi. The initial pressure shall be applied and allowed to stand without makeup water for 3 hours to allow the HDPE pipe to stretch. Return test pressure to 150 psi with makeup water after initial 3 hour period. Allow pipe to stand for two additional hours during the test period, and then measure the amount of water required to return pressure to 150 psi. Allowable makeup water for pipe expansion for 8" diameter pipe is 1.0 gallons per 100-feet of pipe. Check for leaks or significant pressure drops. Correct all leaks and significant pressure drops that require more makeup water than allowable, and retest pipe.

100-3.15 ELECTRICAL CONTINUITY

Electrical continuity is required for six inch or smaller water pipe and fire hydrant assemblies, and shall be provided by two electrical continuity straps installed on each side of the water pipe joint or fittings. Electrical continuity tests will be performed by the CBJ Water Utility Division staff with a "Hovey" water pipe thawing machine, unless scheduling conflicts or mechanical problems with the thawing machine prevent the CBJ Water Utility Division staff from performing the testing within the time period required by the Contractor. In those cases that the CBJ Water Utility Division staff is unable to conduct the testing, the Contractor shall conduct the testing with its own personnel and equipment. The testing shall be performed in a manner that is approved by the Engineer. All resilient seat gate valves 6 inch and smaller are required to have a thaw wire either bolted or cad welded to the valve body, and raised through the inside of the valve box, therefore making it available for both continuity testing, and thawing. An additional thaw wire will still need to be attached to the main, and coiled around the outside of the box according to CBJ standard details.

If the initial testing of an installation within any Project phase fails (the continuity testing will be conducted by the CBJ at one time for each Project phase, as shown on the Drawings, or as directed by the Engineer), the additional testing required shall be at the Contractor's expense. The CBJ Water Utility Division staff will maintain a circuit of 300 amps DC current for a period of 90 seconds. Current loss, through the test circuit, shall not exceed 10%. Continuity test sections shall not exceed 500 lineal feet. All

test leads brought up to the surface shall be removed to a depth of two feet below finish grade upon completion of the tests.

100-3.16 DISINFECTION

Disinfection by chlorination of all new water pipe shall be completed and a satisfactory bacteriological report obtained prior to placing the pipe in service. "Open-bore" flushing shall be completed before chlorination is begun.

Chlorine shall be applied by one of the following methods:

- (a) Liquid chlorine gas-water mixture;
- (b) Direct chlorine gas feed; or
- (c) Hypochlorite commercial products such as HTH, Perchloren, Macho-chlor, or approved equal.

The chlorinating agent shall be applied at the beginning of the section adjacent to the feeder connection, ensuring treatment of the entire water pipe. Water shall be fed slowly into the new water pipe with chlorine applied in amounts to produce a dosage of 50 ppm. Application of the chlorine solution shall continue until the required residual of not less than 50 ppm free chlorine is evident at all extremities of the newly constructed line.

The chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device. Chlorine gas shall be fed directly from a chlorine cylinder equipped with a suitable device for regulating the rate of flow and the effective diffusion of gas within the water pipe. Hypochlorite products shall be placed or injected into the water pipe. During the chlorination process, all intermediate valves and accessories shall be operated. Valves shall be manipulated so that the strong chlorine solution in the water pipe being treated will not flow back into the pipe supplying the water.

The following table is to be used as a guide for chlorinating pipes by the calcium hypochlorite and water mixture method. The given dosage per 100 feet results in a chlorine solution of 40 to 50 ppm. This dosage takes into account that Contractors most frequently use granular HTH, which is 65% pure. If another chlorinating agent is used, the dosage must be adjusted.

PIPE DIAMETER	DOSAGE PER 100 FEET
4"	0.60 oz.
6"	1.35 oz.
8"	2.75 oz.
10"	4.30 oz.
12"	6.19 oz.
16"	11.00 oz.
20"	17.00 oz.

A residual of not less than 50 ppm free chlorine shall be produced in all parts of the water pipe. After 24 hours detention there shall be a minimum free chlorine residual of 25 ppm in all parts of the water pipe. This residual shall then be neutralized in the pipe by injecting an approved reducing agent such as sulfur dioxide, sodium bisulfate, sodium sulfite or sodium thiosulfate.

After the water pipe system has been thoroughly flushed, samples will be taken at representative locations in the system by the Engineer, placed in sterile bottles, and submitted to an approved laboratory for bacteriological examination. The presence of bacteria in any sample shall be verified with a second sample at the same location. If verified, the pipe disinfection procedure shall be repeated and additional samples taken for bacteriological examination. Pipe disinfection shall be repeated, at the Contractor's expense, until satisfactory results are obtained. The first testing sequence will be paid for by the Owner. Any further testing and sampling required due to insufficient disinfection (positive coliform tests) will be paid for by the Contractor.

The water shall be flushed from the water pipe at its extremities, including all curb stops, until the replacement water chlorine residuals are equal to those of the permanent source of supply. The dechlorinated water and water used for flushing shall be disposed of in a manner approved by the Engineer, and in conformance with current requirements of the Alaska Department of Fish and Game, and the Alaska Department of Environmental Conservation.

METHOD OF MEASUREMENT

100-4.1 The water main will be not be measured for payment. The 1-inch water service will be measured by the number of units installed, complete, in place, accepted, and ready for operation.

BASIS OF PAYMENT

100-5.1 Water Main Payment will be made at the contract lump sum price or the unit price for the item installed and accepted in place. The price includes full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

1-inch water service will be measured by the number of units installed and accepted by the Engineer.

Payment will be made under:

- Item U-100a Water Main - per lump sum
- Item U-100b 1-inch water service - per each

ITEM U-200 SANITARY SEWER SYSTEM

DESCRIPTION

200-1.1 This item consists of providing all labor, materials, tools, and equipment necessary for furnishing and installing sanitary sewer pipe, sanitary sewer manholes, and cleanouts complete, and in place in accordance with these Specifications and in reasonably close conformity with the lines and grades shown on the Drawings or established by the Engineer. It shall also include raising or lowering existing sanitary sewer manholes and cleanouts in accordance with these Specifications and in reasonably close conformity with the lines and grades shown on the Drawings and Standard Details. Comply with City & Borough of Juneau (CBJ) requirements.

200-1.2 SUBMITTALS.

The required submittals for this work will be:

- a. **Sanitary Sewer Pipe.** Material certifications stating conformance with the requirements of this section.
- b. **Manholes:** Shop Drawings showing method of construction and reinforcement, invert elevations, and overall dimensions.
- c. **Frames and Grates:** Catalogue cuts and materials certification.
- d. **Pipe Insulation:** Materials certification and overall dimensions.

MATERIALS

200-2.1 BEDDING. Class A bedding shall be aggregate conforming to the following gradation:

Sieve Size	Percent Passing by Weight
1-1/2"	100
No. 4	0-35
No. 200	0-8

Bedding material for pipe placement shall be non-frost susceptible material.

200-2.2 BACKFILL. Use approved materials as shown on the Drawings and in accordance with item D-701-3.5.

200-2.3 SANITARY SEWER GRAVITY PIPE. PVC Sewer Pipe, four inch through 15 inch in diameter, inclusive, shall have a standard dimension ratio (SDR) of 21, and conform to ASTM D3034. Before any PVC pipe is used on this Project, the Contractor shall supply all certifications, signed by an authorized agent of the seller or manufacturer, stating that the material has been sampled, tested and inspected in accordance with ASTM D3034.

PVC Sewer Pipe greater than 15 inch in diameter shall conform to ASTM F 679. Before any PVC pipe is used on this Project, the Contractor shall supply all certifications, signed by an authorized agent of the seller or manufacturer, stating that the material has been sampled, tested and inspected in accordance with ASTM F 679.

The pipe shall have integral wall bell and spigot joints conforming to ASTM D 3212. The bell shall consist of an integral wall section with a solid cross-section elastomeric ring, factory assembled, securely locked in place to prevent displacement.

Flexible water-tight connections, approved by the Engineer, shall be used at PVC pipe connections to manholes and other rigid structures.

200-2.4 SANITARY SEWER PRESSURE PIPE. Use high-density polyethylene (HDPE) pressure pipe and conform to ASTM D3550 designation PE 3407 or PE 3408. The pipe shall have a minimum pressure rating of 100 pounds per square inch and a maximum Standard Dimension Ration (SDR) of 17.0 unless otherwise noted on the Drawings. All HDPE shall have a standard iron pipe size (IPS) outside diameter.

The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions or other injurious defects. It shall be uniform in color, opacity, density, and other physical properties.

HDPE pipe shall have an ASTM D-3350 material Cell Classification of no less than 335434C.

The pipe shall be marked at five foot intervals with a coded number which identifies the manufacturer, SDR size, PPI rating, manufacturing standard reference and production code from which data and place of manufacturer can be determined.

Connection of the pipe and fittings shall be performed by the thermal butt fusion system. HDPE pipe lengths, fittings, and flange adapter connections to be fused shall be of the same type, grade, and class of polyethylene compound and supplied by the same raw material supplier.

200-2.5 UNDERGROUND MARKING TAPE. Underground marking tape shall be green, at least four (4) inches wide, four mil thick, polyethylene tape, with a metallic backing capable of being traced with locators. The tape shall have black letters with the following wording: "Caution: Sewer Line Buried Below." The marking tape shall be installed 12 inches above the top of all sewer mains and services.

200-2.6 AIR RELIEF VALVE. The air relief valve shall be a 2" Crispin Sewage Air Relief Valve Models 20 or approved equal. The air/vacuum relief valve shall be a 2" Crispin Air and Vacuum Relief Valve Model S20A or approved equal

200-2.7 PIPE CONNECTORS. "Mission Flex Seal" connectors will not be acceptable for use on this project.

200-2.8 MANHOLES. All manholes shall consist of precast concrete sections, including integral base section, riser section, cones, and flat slab tops and shall conform to ASTM C 478 and the dimensions shown on the Drawings. All precast sections shall have joints sealed with "RAM-NEK" or "RUB-R-NEK" gasketing materials, or approved equal, installed as specified by the manufacturer. Cones shall be eccentric. Manholes steps shall be cast in all precast manhole sections. Pipe penetration gaskets shall be cast into all precast manholes. Grade rings shall be standard product, manufactured particularly for use in manhole construction, sized to fit the cones on which they are placed, and the wall thickness shall be not less than that of the cones. Grade rings shall be not less than two inches high, nor more than four inches high. Grade rings shall be *Infra-Riser*® or approved equal.

Portland cement concrete cast in place shall conform to Item P-610.

- a. **Frames, Covers, and Steps.** All manholes shall be water watertight, of ductile iron, and conform to the design and dimensions shown the Drawings and CBJ Standard Details. Ductile iron castings shall conform to the requirements of AASHTO M 103. Grade shall be optional unless otherwise designated. Contact surfaces between frames and covers shall be machined to provide a uniform contact surface. When watertight locking devices are specified, the Contractor shall submit Shop Drawings for approval by the Engineer.

All manhole covers shall the work "SEWER" cast into the top in letters approximately three inches high.

Manhole steps shall be constructed of polypropylene conforming to ASTM D4101, and shall meet current state and federal safety standards.

Frames and covers shall be ductile iron, conforming to ASTM A 48, Class 30. The cover shall be designed for the appropriate classification of traffic and shall have the word "SEWER" cast into the top with prominent letters. Bearing surfaces between frame and cover shall be machined to smooth, plane surfaces. Frames and covers shall be Inland Foundry No. 743, or approved equal.

- b. Manhole Grade Ring Adjustment Units.** Manhole grade adjustment units shall be Recycled Adjustment Risers, "Infra-RISER," as manufactured by GNR Technologies, or approved equal. The manufacturing process shall be such that individual units will be consistent in quality and appearance. All rough edges shall be trimmed prior to shipping. Each adjustment riser shall be clearly marked on the inside surface with the manufacturer's name and location of the manufacturer. The thickness of the adjustment riser shall be within 3 mm of the manufacturer's stated dimensions. All other dimensions shall be within 5 mm. Except for shim or wedge units, the deviation from the plane parallel to the theoretical surface shall not be greater than 1 in 500.

The adjustment riser shall consist of no less than 80% by weight recycled rubber from tires, and no less than 10% by volume shredder fiber. The riser shall meet or exceed the following when tested on units not less than 24 hours old, and not more than 60 days old, and maintained at 23±2°C (73±3°F) for at least 12 hours prior to and during testing.

Physical Property	Test Method	Acceptable Results
Density	ASTM C642-90	1.098 ± 0.05 g/cm ³
Durometer hardness – molded surface	GNR method based on ASTM D 2240	75A ± 5 points
Durometer hardness – interior surface	GNR method based on ASTM D 2240	73A ± 5 points
Tensile Strength	ASTM 412-87	1.6 MPa (232 psi) (not <1 Mpa)
Compression Deformation -initial deformation	GNR method based on ASTM D 575	Under 1 MPa (145 psi) 6±2%
Compression Deformation -final deformation	GNR method based on ASTM D 575	Under 1 MPa (145 psi) 6±2%
Compression Set	GNR method based on ASTM D 395	Under 1 MPa (145 psi) 0.4% (=4% max.)
Brittleness at low temperature	ASTM D 746-79	-40° F (-40° C)
Freeze/Thaw when exposed to deicing chemicals	ASTM 672-91	No loss after 50 cycles
Coefficient of thermal expansion	ASTM C 531-85	1.6 X 10 ⁴ mm/mm/°C (8 X 10 ⁵ in/in/°F)
Weathering 70 hr. @ 70°C -hardness retained -compressive strength retained -tensile strength retained -elongation retained	ASTM D 573-88	100% 100% 100% 100%

200-2.9 PIPE INSULATION.

- a. **Rigid Insulation.** Rigid Insulation shall be rigid board closed cell polystyrofoam material containing a flame retardant additive specifically designed for underground pipe or pavement installations, equivalent to Dow Chemical Company Styrofoam HI, and approved by the Engineer
- b. **Spray-on Insulation.** Sprayed-on insulation shall be sprayed-on urethane foam insulation applied directly to the pipe exterior with an elastomeric coating, may be approved by the Engineer, provided the material has demonstrated a satisfactory performance history in underground installation and has the following physical properties:

Density	2 pcf, Minimum
Compressive Strength (ASTM D 1621)	35 psi, Minimum at 5% Deflective or Yield
Water Absorption (ASTM C 177)	0.25% by Vol. Maximum
Thermal Conductivity (ASTM C 177)	Max. 0.23 BTU Hr. Ft ² EF. In. Thickness

200-2.9 MISCELLANEOUS. All pipes, bends, and fittings used in cleanouts, drop connections, and pipe stubs for future connections to manholes shall conform to this section.

Bentonite-Cement sealing plaster shall consist of two parts bentonite, one part Type 3 cement, and one part sand, with sufficient water to obtain workable consistency.

Mortar shall consist of one part Portland cement to two parts clean, well-graded sand, which will pass a No. 4 screen. Admixtures may be used not exceeding the following percentages of weight of cement; hydrated lime, 10%; diatomaceous earth or other inert material, 5%. Consistency of mortar shall be such that it will readily adhere to the surface. Mortar mixed for longer than thirty minutes shall not be used. A non-shrink mortar may be submitted for approval as a substitute.

Grout shall be a non-shrink type approved by the Engineer.

Pipe penetration gasket through the manhole wall shall be cast-in-place Dura-Seal III, or approved equal, as manufactured by Dura-Tech, Inc., Kor-N-Seal Cavity O-Ring, or approved equal, as manufactured by NPC Inc. shall be used for filling the preformed void in the connection gasket.

Manhole exterior joint waterproofing shall be a Miradri system as manufactured by Carlisle CCW, including Carlisle – CCW 704 primer, CCW Miradri 861Membrane, and CCW 704 mastic, or approved equal that includes a membrane and adhesive system for positive water exclusion. The membrane shall extend at least 18-inches each side of manhole joints, except this width may be reduced to 9-inches each side of manhole joints if the joint is less than 4-feet below finish grade and the joint is above the maximum water table.

Delete the requirement for the flexible annular space filler, as shown on CBJ Standard Detail 209 – Manhole Connection Details, for the Flexible Seal Adapter.

CONSTRUCTION REQUIREMENTS

200-3.1 GENERAL. Complete the sanitary sewer system and make sure it operates properly at the time of acceptance of the work. Furnish and install all incidental parts not shown on the Drawings or specified in this section that are necessary to complete the sanitary sewer system.

Meet the applicable provisions of Item P-152 for excavation, U-200 for bedding, D-701 for backfill, and P-610 for concrete structures.

Consult the Drawings for estimated locations of existing sewers, water mains, and other utilities near the construction. Use this data for general information only. CBJ does not guarantee their accuracy. Confirm and mark the exact locations of all existing utilities before starting work. The Contractor shall preserve and protect all existing utilities and other facilities including but not limited to: telephone, television, electrical, water and sewer utilities, surface or storm drainage, highway or street signs, mail boxes, and survey monuments.

Excavate, bore, or probe by hand ahead of your work where necessary to determine the exact location of underground conduit or other features that might interfere with construction. Support and protect conduits or other services that cross the trench. Immediately replace any existing valves, valve boxes, or water lines that you break or damage.

The Contractor shall give at least 24-hours notice to the CBJ Water and Wastewater Utility Divisions and the CBJ Engineering Department prior to:

1. needing water or sewer main line locates;
2. interruption of sewer service in any area

Any sewer service disruption shall be restored as soon as possible. The Contractor shall comply with the current policy on "Water and Sewer Line Locates" of the CBJ Public Works Department, Water and Wastewater Utilities Divisions.

If construction operations cause service interruptions, the Contractor is responsible for all damages.

Where water mains under this contract approach within 10 feet horizontal clearance and are below or less than 18 inches above existing sanitary sewers, encase the sanitary sewer with a jacket of concrete 3 inches thick for 10 feet on each side of the crossings.

Concrete encasement is not required if the existing sewer is constructed of ductile iron pipe with joints at least 8 feet from the water main, or if you replace the existing sewer with ductile iron pipe or PVC pressure pipe.

Support and protect existing conduits or utilities, which are not scheduled for removal or abandonment, when encountered in the excavation.

Remove and dispose of unsuitable foundation material below the designed elevation as directed. Replace with approved material. Remove rock or other unyielding material, when encountered, to the depth indicated or as directed and replace with approved material.

Place bedding and backfill in uniform layers not more than 6 inches deep and compact to meet the requirements specified in this section. Ponding or jetting is not permitted.

Use bedding material for backfill to a level 12 inches above the pipe. Use excavated native material for the remainder of the backfill if it meets the requirements for backfill specified in Item D-701-3.5. Within the pavement structure, use bedding material and backfill meeting the requirements for the applicable lift of material.

Remove all sheeting and bracing used in structure excavation upon completion of the work.

200-3.2 SANITARY SEWER MANHOLES AND CLEANOUTS. Portland cement concrete cast in place shall conform to the requirements of Item P-610. Concrete shall not be placed under water. Running water shall not be permitted over newly poured concrete.

Manholes shall be constructed in a dry excavation on a six inch compacted (95%) base of D-1. The excavation shall be kept dry until the concrete or mortar has developed sufficient strength to prevent rupture by groundwater pressure.

Manhole inverts shall be formed as shown on the Drawings, either by laying pipe through and cutting out the top portion before completion of the base of the manholes, or by forming U-shaped channels in the concrete base section. Cut edges of pipe laid through the manhole shall be fully covered by concrete when the manhole invert is complete. The finished invert shall be smooth and true to grade. No mortar or broken pieces of pipe shall be allowed to enter the sewers.

Precast bases sections shall be set on a level base of six inches of compacted D-1, as shown in the Standard Details. Provisions shall be made to prevent flotation of the manhole.

All lifting holes shall be plugged with Bentonite-Cement sealing plaster and sealed with a Miradri System patch, or approved equal, to a minimum of six inches from the edges of the opening, as required to prevent leakage.

After completion of the manhole, all plugs shall be completely removed from the sewers and all loose material shall be removed from the manhole.

Service connections shall not be installed into manholes unless otherwise shown on the Drawings or directed by the Engineer. Where service connections into manholes are allowed, the top of the service sewer pipe shall be 0.2 feet higher than the top of the downstream main sewer pipe. The manhole invert shall be channeled for the service connection sewers in the same manner as for main sewers.

Connection to existing manholes shall be made in such a manner that the modified manhole is equal to a new manhole in appearance and performance. A channel, approximately two inches larger all around than the connecting pipe, shall be cut into the existing manhole base. The new pipe shall be connected as shown on the Drawings and Standard Details. The rough-cut channel shall be finished to its final smooth and uniform shape with mortar. The existing sewer(s) shall be maintained in service and the fresh concrete and mortar surface shall be protected from the flowing sewage for a minimum of 24 hours.

Drop construction at manholes shall be as shown on the Drawings and Standard Details.

The joint exterior waterproofing system shall be installed as recommended by the system manufacturer and as shown on the Drawings and Standard Details.

All manholes will be visually inspected by the Engineer; there shall be no evidence of leakage of water into any manhole from outside sources or any imperfections which may allow such leakage.

Manhole Grade Ring Adjustment Units are required for each new sanitary sewer manhole, reconstructed sanitary sewer manhole, and adjustment of existing manhole to grade.

- a. Each manhole shall contain at least one recycled rubber riser, with thickness varying to match frame and cover to finish grade requirements, to form the final surface for installation of the frame.

- b. The total height of the rubber adjustment riser shall be a minimum of 1-inch and a maximum of 3-inch.
- c. Concrete and steel surfaces to receive sealing compound shall be clean, dry and free of grease or oils.
- d. Adjustment risers shall be bonded to adjacent surfaces by laying a continuous bead, 5/16" thick cold applied joint sealant compound conforming to ASTM D 1850 (PL Premium POLYURETHANE Door, Window & Siding Sealant or PL Premium POLYURETHANE Concrete & Masonry Sealant, formerly Chemrex CX-22) or equivalent, on the top surface of the concrete course, or the bottom surface of the riser, on a diameter 1" smaller than the outside diameter of the rubber adjustment riser.
- e. The adjustment riser shall then be seated firmly in place, ensuring it is centered over the opening. Apply a second continuous strip of sealant to the top surface of adjustment riser, 0.5" from the outside diameter of the rubber adjustment riser or manhole frame.
- f. The adjustment riser must form the final surface for the seating of the frame and cover assembly. Concrete adjustment units must not form the final surface for seating the frame.
- g. If more than one adjustment riser is required, a continuous bead of sealant shall be applied between each unit in the same manner as in paragraph 4 above. A continuous bead of sealant shall also be placed on the top surface of the concrete course or on the bottom surface of the bottom riser and to the top surface of the top adjustment riser.
- h. The frame shall then be set firmly in place ensuring that it is properly centered over the structure opening and is firmly contacting the rubber riser through the sealant.
- i. Adjustment risers shall have an inside diameter that is within 2" of the inside diameter of the concrete structure, and equal to the outside diameter of the concrete structure $\pm 2"$.

Manhole frames and covers shall be set to final grade prior to final paving operations, with the compacted pavement to provide a depression to the top of manhole frame within the allowable limits of 3/8-inch minimum to 3/4-inch maximum, as determined by using an 8-foot long straight edge across the frame in all directions.

- a. The frame can be set to final position prior to the laydown machine passing over the structure, or immediately following the laydown machine passing over the structure.
- b. The intended purpose of these requirements is that the asphalt pavement is compacted to grade around the frame and cover with no cut out of compacted pavement allowed.
- c. If the depression of the frame and cover below finish pavement is found to be out of allowable tolerances after the pavement has cooled to the point that sawcutting and removal of the pavement is necessary, the following corrective action will be required:
 - (1) A square cut-out of the pavement shall be made to a minimum of 6-inches and maximum of 8-inches outside the edge of frame flange, with this cut-out oriented with the sides at 45° to traffic.

- (2) A concrete transition slab shall be constructed as shown in the detail on the Drawings. This slab shall be allowed to cure for a minimum of 48 hours before placing the hot asphalt mix over the transition slab.
- (3) This Work shall be completed prior to the street fog sealing operation.

Manhole riser rings shall be sealed to the top of manhole cone or flattop and to each other with one run of "RAM-NEK" or "RUB-R-NEK" around the inside edge and one run around the outside edge of the riser ring. The units shall be heated and compressed to at least 50% of original thickness of the "RAM-NEK" or "RUB-R-NEK." No grout shall be used to seal the riser rings.

Connect to Existing Manhole:

Contractor shall remove or plug existing pipe as applicable, drill hole at new location required for installation of sewer under this contract, install pipe, seal the pipe penetration, form channeled inverts, install drop connections as required, and backfill as require.

200-3.3 SANITARY SEWER PIPE. Install pipe and fittings according to these Specifications or the manufacturer's recommendations. Lay pipe to the grades and lines specified or as directed by the Engineer.

Excavation, and backfill shall conform to the requirements of Item P-152, Item D-701-3.5 respectively. Underground marking tape shall be installed as shown on CBJ Standard Detail 125 - Pavement Resurfacing and Trench Detail.

Sheeting and bracing required for trenches shall be removed to the elevation of the conduit, but no sheeting will be allowed to be pulled, removed, or disturbed below the conduit. Sheeting and bracing shall meet OSHA requirements.

Before lowering into the trench, the pipe shall be inspected for defects. All cracked, chipped, or broken pipe shall be discarded. The ends and interior of the pipe shall be clean. Belled ends shall be laid upgrade. Handling of the pipe shall be accomplished in a manner that will not damage the pipe. The joint shall be made in the manner recommended by the manufacturer. Care shall be taken not to buckle or disturb previously laid pipe.

Pipe shall be laid accurately to the staked line and grade. All service connections shall be installed as indicated on the Drawings. Where existing service sewers are to be connected, suitable fittings and adapters shall be provided by the Contractor.

Pipe shall be cleaned of all foreign matter, and water shall be kept out of trenches until joints have been completed. When work is not in progress, open ends of pipe and fittings shall be securely closed to keep foreign matter and animals from entering.

Each joint shall be inspected to ensure that it is properly made before backfilling is done. Care shall be taken to prevent any dirt or foreign matter from entering the open end of the pipe. Where it is necessary to cut pipe, such cuts shall be neatly made in an approved manner. The laid pipe shall be true to line and grade and, when completed, the sewer shall have a smooth and uniform invert. No section of gravity sewer, including service connections shall have an adverse grade which would pond water in the invert of the sewer.

Connections to pipe stubs of a different pipe material shall be made with DFW/HPI nonshear-type connector, as shown in CBJ Standard Detail 218 - Coupling for Dissimilar Sanitary Sewer Pipes. Connectors must be approved by the Engineer prior to installation.

Connections to pipe stubs of a different pipe material, if made beyond the back of sidewalk or other concrete or paved surface, shall be made with a suitable connector. Connectors must be approved by the Engineer prior to installation. Connection of all piping, other than bell and spigot connections, within the roadway, street and sidewalk areas, shall be made per CBJ Standard Detail 218 - Coupling for Dissimilar Sanitary Sewer Pipes.

Connections to existing sewer mains, service connections, and manholes shall be made in such a manner so as to not damage the existing facility. Such connections shall be made so that no projections or rough surfaces occur within the pipe.

Locations of the sewer laterals are approximate and may be changed by the Engineer. Relocating of the sewer lateral will not add extra cost to the Owner, unless either of the following conditions result:

- a. The relocation results in a significant increase in the length of the lateral; or,
- b. There are significant differences in the surface characteristics at the new lateral location that would result in substantial and foreseeable changes in construction methods and materials.

If the Contractor believes that the work at the new location(s) will result in a substantive change, the Contractor shall notify the Engineer prior to beginning the changed work. The Engineer will evaluate the request and if the relocation is warranted, the change in work shall be authorized.

Lateral connections to existing sewer mains shall not obstruct flow and shall be one of the following:

- a. Approved remote tapping system
- b. Polyethylene saddle strapped to line with two stainless steel bands and neoprene gaskets.
- c. Sidewall fused to line as recommended by pipe manufacturer.
- d. Manufactured saddle per CBJ Standard Detail 210 - Sanitary Sewer Saddle Tee.

Cleanouts shall be provided with a cast iron ring and cover which shall be locking-type Olympic Foundry No. M-1025, or approved equal. The cover shall be clearly marked with the word "SEWER" cast into it.

Lateral connections to new sewer mains shall be made with a manufactured sanitary wye of the same material as the mainline pipe.

The Contractor shall determine the location of the existing sewer services prior to installation of the mainline pipe in such a way that the service wyes can be installed in the proper location as the mainline pipe is being installed. No service saddles will be permitted, unless approved by the Engineer.

All HDPE Pressure Pipe and fittings shall be butt-fused in accordance with ASTM D2657. The individual who performed the butt-fusion shall have written certification from an HDPE pipe manufacturer stating he/she has successfully completed an 8-hour (minimum) certification class on butt-fusion techniques and procedure. In addition, this individual shall have fused a combined total of more than 5,000 feet of HDPE pipe in diameters 4-inches and larger. Prior to commencement of Work, submit a copy of the certification and written documentation of his/her experience detailing project location, diameter or fused piping, and length of fused piping for each applicable project.

The Contractor shall ensure that each joint is fused at the temperature and pressure recommended by the pipe manufacturer in order to achieve the maximum pressure rating for that joint. All butt-fused joint for HDPE piping and fabricated fittings shall be documented by a computer datalogger that record

pressure and temperature applied at each fused joint, along with the data and time the joint was fused. Computer printouts and electronic data for each fitting shall be submitted to the Engineer prior to installation of the fitting. All fittings for the Project shall be labeled with a unique identifier that corresponds with the fusion computer printouts for each fitting. Computer printouts, electronic data, and the Project station for each field fused joint shall be submitted to the Engineer at the end of each work shift.

The use of electro-fusion couplings to join HDPE piping may be allowed upon written approval of the Engineer. Electro-fusion couplings shall comply with ASTM F1055. Contractor shall as-built the exact location of any installed electro-fusion coupling.

Prior to back fill and commissioning of pipe the Contractor shall operate the butterfly valve to insure that the valve disk can operate without interference from the flange connection. The Contractor shall realign as necessary at no additional cost to the Owner

Contractor shall inspect the HDPE piping for damage immediately prior to joining. Damage is defined as gouges exceeding 10 percent of the pipe wall thickness, kinked pipe sections, pipe sections flattened to more than 5 percent of the original diameter, or any abrasion of cutting of the inside surface of the piping. Damaged portions of piping shall be cut out and discarded.

The handling of the joined pipeline shall be in such a manner that the pipe is not damaged. Ropes, fabric or rubber-protected slings, or straps shall be used when handling pipes. Chains, Cables, or hooks inserted into the pipe ends shall not be allowed. Two slings spread apart shall be used for lifting each length of pipe slings for handling the pipeline shall not be positioned at butt-fused joints. Sections of the pipeline with cuts or gouges exceeding 10 percent of the pipe wall thickness, kinked sections, or sections flattened to more than 5 percent of the original diameter shall be cut out and discarded, and the end of the pipeline rejoined.

The horizontal bending radius for HDPE piping shall not be less than the minimum radius recommended by the piping manufacturer.

200-3.4 PIPE INSULATION. When sewer pipes or service pipes have less than 5-feet of cover to finished grade or vertical clearance at a culvert crossing, either above or below, they shall be insulated as directed by the Engineer.

Rigid insulation shall be a minimum of 2-feet wide and 4-inches thick. The length of insulation required shall be as shown on the Drawings or as directed by the Engineer. Insulation shall be placed between 1 and 12 inches from the service pipe with the width centered on the longitudinal axis of the sewer pipe or service pipe as directed by the Engineer.

Sprayed-on urethane foam insulation shall be a minimum of 4-inches thick and be installed in strict conformance with the manufacturer's recommendations. Precautions to protect Contractor personnel, Project inspectors, and the public in general shall be taken by the Contractor in compliance with OSHA Standards and the manufacturer's recommendations.

200-3.5 TESTING. Prior to testing all manholes, all sections of pipe shall be cleaned using an inflatable rubber ball of a size that will inflate to fit snugly into the pipe. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball shall be placed in the last clean out or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the force of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe, stops the ball, the Contractor shall remove the obstruction and make any necessary repairs in a manner that is acceptable to the Engineer. Any alternate methods of cleaning sewers shall be submitted to the Engineer for approval, and shall not be used unless approved.

Prior to testing, the sewer shall be complete with laterals, and trenches shall be fully backfilled and compacted to finish grade, or, if the sewer is under pavement, finish pavement subgrade.

For work involving placement of new gravity flow sanitary sewer collection systems, all sections of gravity flow pipe shall be tested for leakage using the Exfiltration Test for either air or water as specified hereafter; or, at the sole direction of the Engineer, when the normal water table is above the sewer throughout the section under test, the Engineer may permit use of the Infiltration Test procedure specified hereafter. Where leakage is in excess of the specified rate, the sewer shall be repaired by the Contractor as required to comply with the leakage test requirements. The Engineer may require the Contractor to repair obvious leaks even though the total length of the test section falls within the maximum allowable leakage for the test used.

The Engineer will make one complete TV inspection after all sewers have passed the specified water tightness test. All defects regarding sewer alignment and grade, damaged pipe, and visible leaks observed during this inspection, shall be corrected by the Contractor. The Contractor shall de-water the sewers as required for the performance of the TV inspection work by the Engineer. The Contractor shall be responsible for all costs associated with any TV inspection required following the initial TV inspection, if any defects were observed during this or any subsequent TV inspections.

- a. **Hydrostatic Testing.** The newly installed HDPE Pressure Pipe main shall be hydrostatically tested to the rated operating pressure of the pipe. The rated operating pressure of HDPE SDR17 piping is 100 psi. Hydrostatic test pressure shall be 100 psi. Gradually pressurize the test section to test pressure and maintain test pressure. It is not necessary to monitor amount of water added during the initial expansion phase. Immediately following the initial expansion phase, reduce test pressure by 10 psi and stop adding test liquid. If there are no visible leaks and the test pressure remains steady (within 5 percent of the target value) for one (1) hour, the main shall be deemed as having passed the test.

If the test is not successful within this total time, the test section should be depressurized and testing shall not recommence on the test section for at least eight hours.

b. Hydrostatic Test Procedure for Sewer Force Mains.

- (1) The hydrostatic test procedure for HDPE Sanitary Sewer Pipe shall consist of two (2) steps: the initial expansion phase and the test period. In order to accommodate the initial expansion of the pipe under test, sufficient make-up water shall be added to the system at hourly intervals for three hours to return to the test pressure. The test period begins after the final addition of make-up water in the expansion phase of the test procedure. The test period is three (3) hours. After this test period, a measured amount of make-up water shall be added to return to test pressure. The amount of make-up water shall not exceed the allowable expansion in U.S. gallons shown in the following table:

THREE HOUR TEST

Nominal Pipe Size (inches)	Allowance For Expansion (U.S. Gal. Per 100 feet of Pipe)
2	0.19

- (2) Under no circumstances shall the total test procedure exceed eight hours at 1.5 times the pipe pressure rating. If the test is not completed within eight hours, the test section shall not be re-tested for eight more hours. Repair and re-testing shall continue until a passing test is obtained.

c. Filtration Test Procedure. (Using Air)

- (1) The Contractor shall furnish all facilities and personnel for conducting the test under the observation of the Engineer. The equipment and personnel shall be subject to the approval of the Engineer. Joints only may be tested in pipe 36 inches in diameter or larger, at the option of the Contractor.
- (2) Immediately following the pipe cleaning, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches five pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.
- (3) The pipeline shall be considered acceptable when tested at an average pressure of four psi greater than the average pressure of any ground water that may submerge the pipe if the section under test does not lose air at a rate greater than 0.0030 cubic feet per minute per square foot of internal surface.
- (4) The requirements of this Specification shall be considered satisfied if the time required for the pressure to decrease from 4.5 psi to 3.5 psi above average ground water pressure is greater than that shown on the following table:

**TIME FOR PRESSURE TO DROP FROM
4.5 TO 3.5 PSI ABOVE AVERAGE GROUND WATER PRESSURE**

PIPE DIAMETER	MINUTES	SECONDS
4"	1	54
6"	2	50

- (5) For other sizes, determine test time using the following formula:
$$T = 28.33 D$$
Where T = time in seconds
D = pipe diameter in inches
- (6) Pressure gauges should be incremented in not more than one-half pound increments for accurate tests.
- (7) Braces shall be required to hold plugs in place and to prevent the sudden release of the compressed air. Due to the large forces that could be exerted by an escaping plug during the testing of the pipe, no one shall be allowed in the manholes in which plugs have been placed while tests are being conducted. The Contractor's testing equipment shall have a pressure relief device that will prohibit the pressure in the pipeline from exceeding ten pounds per square inch.

d. Infiltration Test Procedure.

- (1) Infiltration testing may be allowed at the Engineer's option when the natural ground water table is above the crown of the higher end of the test section and the external water pressure exerted on the pipe is equivalent to the exfiltration test. The maximum allowable limit for infiltration shall be as determined by the formulas defined in the above section Exfiltration Test (Using Water).

e. Pressure Sewer Test Procedure.

- (1) The Contractor shall, in the presence of the Engineer, test all pressure sewer pipe to a test pressure of 100 pounds per square inch and maintain the pressure a minimum of one hour. The Contractor shall make all necessary arrangements to provide water for testing pipelines.
- (2) Leakage shall not be in excess of five gallons per inch of pipe diameter per one thousand (1,000) feet of pipe per day. Where leakage is in excess of the specified rate, the Contractor shall make all repairs necessary to reduce the amount of leakage to a quantity within the specified rate. The testing and repair process shall be repeated until the installation is accepted. In addition, the Contractor shall repair all visible leaks.

METHOD OF MEASUREMENT

200-4.1 This item will not be measured for payment. The Engineer's acceptance constitutes measurement.

BASIS OF PAYMENT

200-5.1 At the contact lump sum price to include all labor, equipment, and materials to complete the work described in this item and on the plans. Any costs involved in service changeovers and providing temporary sewer serviced are subsidiary. Removing or abandoning existing sewer lines or appurtenances designated on the plans is subsidiary. Excavation, backfill, and bedding are subsidiary.

Payment will be made under:

- Item U-200a Sanitary Sewer System - per lump sum
- Item U-200b Sanitary Sewer Services & Laterals – per lump sum

ITEM U-400 TELEPHONE SYSTEM

DESCRIPTION

400-1.1 Provide all coordination work necessary to allow ACS to supply and install equipment and materials needed to extend their existing utility services as shown on the plans. Perform work in conformance with the plans and per ACS Specifications. All utility work shall be paid for by the City & Borough of Juneau (CBJ). Contractor shall provide all necessary coordination with the utility companies to allow them to perform their work.

MATERIALS

400-2.1 Provide submittals neatly bound and clearly indexed, and include applicable catalog numbers, cuts, wiring diagrams, performance data, operation and maintenance manuals, etc., for all material and equipment listed in the Staking Sheets, ACS Specifications and RUS Detail Sheets.

CONSTRUCTION REQUIREMENTS

400-3.1 Follow the current ACS Standards and Specifications. The local utility companies can be contacted by calling the phone numbers listed in Section 50-06.

Perform all work with qualified personnel licensed for the work involved.

Perform construction work in a thorough and workmanlike manner in accordance with the Staking Sheets, plans and specifications, and the construction drawings.

Installer must be approved by ACS.

Record exact locations of poles, guys and anchors. Record conductor sag and temperature when conductor was installed.

Coordinate utility work to avoid conflicts with other trades, and unscheduled service outages, Coordinate with utilities to provide as-built records of their work for incorporation into final as-built drawings.

After installation is complete, test for continuity and faults. Correct any deficiencies. After testing is complete, demonstrate that work conforms with plans, specifications, and staking sheets and is a complete and operable system.

Furnish a written guarantee that any materials or workmanship found defective within one year of final acceptance will be replaced at the Contractor's expense, promptly upon notification and to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

400-4.1 This work will not be measured for payment. The Communications Utility Work consists of all work required on this project by the Comm or Communications Utility ACS. This included removing existing services, conduit, cabling, pedestals, etc. and providing new services, conduit, cabling, pedestals, etc. All excavation, bedding, backfill and other utility work required is incidental to this item. All time required to coordinate with the utility and time to allow them to do their work is incidental to this item. Provide all cutting, patching of asphalt and concrete needed for the utilities to do their work. Cutting and patching of concrete and asphalt shall be provided as needed and is incidental to the pay item. No other payment for this work will be provided. Pay ACS for their work. Payment for ACS work is included in this pay item.

BASIS OF PAYMENT

400-5.1 Payment will be made at the contract lump sum price for the completed and accepted job. This price will be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item U-400b Communications Utility Work – per lump sum

ITEM U-500 ELECTRICAL SYSTEM

DESCRIPTION

500-1.1 Provide all coordination work necessary to allow AEL&P supply and install equipment and materials needed to extend their existing utility services as shown on the Plans. Perform work in conformance with the plans and per AEL&P Specifications. All utility work shall be paid for by the City & Borough of Juneau (CBJ). Contractor shall provide all necessary coordination with the utility companies to allow them to perform their work.

MATERIALS

500-2.1 Provide submittals neatly bound and clearly indexed, and include applicable catalog numbers, cuts, wiring diagrams, performance data, operation and maintenance manuals, etc., for all material and equipment listed in the Staking Sheets, AEL&P Specifications and RUS Detail Sheets.

CONSTRUCTION REQUIREMENTS

500-3.1 Follow the current AEL&P Standards and Specifications. The local utility companies can be contacted by calling the phone numbers listed in Section 50-06.

Perform all work with qualified personnel licensed for the work involved.

Perform construction work in a thorough and workmanlike manner in accordance with the Staking Sheets, plans and specifications, and the construction drawings.

Installer must be approved by AEL&P.

Record exact locations of poles, guys and anchors. Record conductor sag and temperature when conductor was installed.

Coordinate utility work to avoid conflicts with other trades, and unscheduled service outages, Coordinate with utilities to provide as-built records of their work for incorporation into final as-built drawings.

After installation is complete, test for continuity and faults. Correct any deficiencies. After testing is complete, demonstrate that work conforms with plans, specifications, and staking sheets and is a complete and operable system.

Furnish a written guarantee that any materials or workmanship found defective within one year of final acceptance will be replaced at the Contractor's expense, promptly upon notification and to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

500-4.1 This work will not be measured for payment. The Power Utility Work consists of all work required on this project by the Power Utility AELP. This included removing existing services, conduit, cabling, transformers, pedestals, etc. and providing new services, conduit, cabling, pedestals, transformers, junction boxes, etc. All excavation, bedding, backfill and other utility work required is incidental to this item. This includes all new utility work in the NW development area to remove power to existing services and provide new power to existing services and future lease lots. This includes provide new services to the three new load centers. All time required to coordinate with the utility and time to allow them to do their work is incidental to this item. Provide all cutting, patching of asphalt and concrete needed for the utilities to do their work. Cutting and patching of concrete and asphalt shall be provided as needed and is incidental to the pay item. No other payment for this work will be provided. Pay AELP for their work. Payment for AELP work is included in this pay item.

BASIS OF PAYMENT

500-5.1 Payment will be made at the contract lump sum price for the completed and accepted job. This price will be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item U-500b Power Utility Work – per lump sum

ITEM U-700 GROUND LOOP, HORIZONTAL PIPING

DESCRIPTION

700-1.1 This work consists of providing all labor, materials, tools and equipment for furnishing and installing Ground Loop, Horizontal Piping in accordance with these Specifications and in reasonably close conformity with the lines and grades shown on the Drawings and Standard Details. Comply with City & Borough of Juneau (CBJ) requirements and the International Ground Source Heat Pump Association (IGSHPA) Standard 21015, 21020, 21030, and 21060.

- a. This Section includes the installation of piping in vertical boreholes and headering piping connecting the boreholes to the building. The system will operate between 20F and 80F.
- b. Provide a complete geothermal loopfield and site restoration including, but not limited to, surveys, underground drilling equipment, drilling mud containment equipment, grouting, piping and appurtenances, pipe fusion and data logging, testing and purging, dewatering pumps, supports, surface excavation, backfill materials, rough grading requirements, soil compaction, waste removal, surface restoration, and labor required for a complete and working system.
 - (1) Site shall be restored as indicated on the construction documents.
 - (2) Drilling methods (rotary, air, mist, mud, etc.) are at the discretion of the Contractor.
- c. **Buried Utilities.** Provide field locates of all utilities in the project area prior to digging. Dial Before You Dig at 907-586-1333.
 - (1) The drawings may not show all buried utilities and are no guarantee that all utilities are shown. Some areas may require hand digging to locate utilities.
 - (2) Buried utilities that are damaged during the course of the Work shall be repaired at Contractor's expense.
 - (3) Any offsets required to route over or under existing piping and conduit shall be included in the bid price of the project.
- d. **Scope.**
 - (1) The loopfield is to consist of 6-inch diameter vertical boreholes with u-tube assemblies drilled with a wet rotary drilling machine and sealed with a Bentonite grout with high thermal conductive properties. The loop field will be split into four sections for diversity with each section vertical loops joined together in a common manifold piping system. Four sets of common GSHS and GSHR mains shall terminate where shown approximately 15 feet from the site of the Snow Removal Equipment Building that will be constructed by others.
 - (2) Loop field to be a located as shown on the site plan sheets with a total of 144 wells drilled on 20 foot centers. Each well will be comprised of a 3/4-inch diameter U-tube and be 300 feet deep. Estimated total flow rate is 290 gpm; Four sets of 3-inch diameter GSHS and GSHR piping mains and a developed total exterior head of 25 feet (includes horizontal and vertical piping) to the manifolds.
 - (3) Individual borehole piping shall be connected to the horizontal piping mains configured for the four sections. The four sets of 3-inch GSHS and GSHR horizontal mains (eight pipes total) will be routed under the access road, to a termination point near the future SREF building. The horizontal mains will be backfilled with approximate 5 feet of cover.
 - (4) Work will also include:
 - (a) Site Contractor to excavate loop field site so that top of each well/casing is approximately 6 feet below finished grade. At minimum trenches are to be excavated for the geo branch mains as detailed.

- (b) Casing for the first 40 feet of each borehole.
 - (c) Each borehole to be completely filled with Bentonite grout of minimum conductivity of 0.76 Btu/hr-ft-F or greater.
 - (d) The vertical borehole loops will be joined together horizontally utilizing branch main piping sized for an equal pressure drop starting at 3/4-inch size and ending at 3-inch size.
 - (e) The geothermal mains will be insulated with 1-inch thick urethane preformed pipe insulation.
 - (f) Rigid board insulation will be installed over geothermal mains as detailed.
 - (g) Prior to backfilling of the field, the finished loop field is to be purged of all air by the Contractor and charged with water. Total exterior system to GS main termination point is 4,400 gallons.
 - (h) Backfill the loop field so that the tops of boreholes are at 6 feet and horizontal mains are at nominally 5 feet below finished grade as detailed on the drawings.
- (5) Work will also include: Extension of existing geothermal mains at the horizontal loop field termination point at the NE taxiway. Provide a capped extension for each of the existing twelve 4-inch diameter HDPE pipes. Extension of the piping shall be approximately 150 feet. Relocate the existing orange location barrels to the extended termination location. See civil drawings for location.

700-1.2 RELATED SECTIONS.

- a. **P-151 Clearing and Grubbing.** Procedures for site clearing.
- b. **P-152 Excavation and Embankment.** Procedures for removal, hauling, embankment (or Waste Disposal), Placement, Materials, Grading and Compaction of all materials required to construct the Ground Loop Heat Pump Piping during execution of work of this section.

700-1.4 ADMINISTRATIVE REQUIREMENTS. A pre-installation meeting shall be held one week before starting work of this section. Require attendance by all installers involved with site work. Coordinate with Snow Removal Equipment Contractor.

700-1.4 SUBMITTALS.

- a. **Qualifications and Installation Plan.** Submit a work plan, qualifications and experience thirty (30) days prior to commencing the Work.
 - (1) **Work Plan.** Contractor shall submit a complete operational plan for drilling and installation of Geothermal Loop Fields. Plan shall include schedule of work, equipment to be used, drilling methods proposed, tubing manufacturer utilized, and equipment and methods proposed for heat fusion welding, operational safety, and security issues.
 - (2) Mechanical Administrator and Superintendent Qualifications and certifications for State of Alaska Work. See requirements later in this section.
 - (3) **Driller Qualifications and Experience.**
 - (a) Accredited Driller per International Ground Source Heat Pump Association (IGSHPA) required.
 - (b) List experience using drilling equipment proposed.
 - (c) List experience with gravel packing and grouting backfill of boreholes. See Section 1.7 Quality Assurance.
 - (d) List experience and provide a plan for containment of drilling fluids on-site.
 - (4) **Horizontal Piping Installation Qualifications and Experience.**
 - (a) Accredited Installer per IGSHPA required.

- (b) List experience with the proposed heat fusion and data logging equipment. See Section 1.7 Quality Assurance.
 - (c) Provide documentation of the manufacturer's qualification course with the proposed heat fusion equipment for all installers
- b. Product Data, Polyethylene Piping.** Provide manufacturer's data for piping and pipe fittings, showing compliance with specified requirements.
- (1) Provide manufacturer's recommendations for fusion jointing.
 - (2) Include certification of long term hydrostatic basis, or test reports.
 - (3) Provide indication of markings for pipe specifications and lengths.
- c. Product Data, Grout and Slurry.** Provide information on thermal conductivity of proposed materials.
- d. Other Product Data.** Provide pipe and rigid board insulation material data.
- e. Test Reports, Piping.** Indicate test method and results of hydrostatic pressure tests.
- f. Field Quality Control.**
- (1) Borehole log for each borehole with brief description of the borehole column materials and water content for various depths. Similar boreholes may be included on one log.
 - (2) U-bend pressure test report for each U-bend assembly to be performed prior to backfilling.
 - (3) Provide a complete report of each joint fusion test with ambient air temperature, fusion temperatures, fusion time, and torque values. Number each joint and show the location on the Record Documents as-built survey.
 - (4) Hydrostatic test report at both vertical borehole and the horizontal loop field piping mains extension.
 - (5) Flush and air purge report.
 - (6) **Record Documents.** Site survey of piping and boreholes, with dimensions from established features. Record actual locations of all underground piping installed relative to Owner's permanent structure on same property.

700-1.5 QUALITY ASSURANCE.

- a. Installer Qualifications.** The work shall be performed by a geothermal loop field Installer and Driller accredited by the IGSHPA. Installer and Driller may be the same person. Accreditation shall be kept up to date and maintained for the duration of the project.
- b. Vertical Borehole Drilling.** A worker(s) with the following minimum qualifications shall be directly responsible for drilling the boreholes, installing the u-bend assemblies and backfilling and grouting the boreholes.
 - (1) Previous experience drilling a minimum of 5,000 lineal feet of 4" to 8" diameter boreholes. Provide verifiable experience of having drilled two boreholes, minimum of 300' deep, located within 20' or less from each other.
 - (2) Demonstrated experience with gravel packing/backfill of boreholes.

- (3) Demonstrated ability to contain drilling fluids on-site (if applicable to proposed drilling method).

c. Horizontal Pipe Installation

- (1) A person with the following minimum qualifications shall be directly responsible for the piping installation and field quality control.
 - (a) Verifiable experience installing a minimum of 5,000 lineal feet of 1" to 4" HDPE piping with socket, butt, and sidewall fusion joints.
 - (b) Demonstrated experience in pipe layout and handling, fusion heating temperature calibration, and visual joint inspection.
 - (c) Demonstrated experience in field quality control as specified herein.

d. Piping Installers

- (1) All piping installers shall have completed a heat fusion school in which each participant has performed heat fusion procedures on piping from 3/4" to 4" diameter under direct supervision of an approved manufacturing certification program.
- (2) Minimum 2 years' experience installing HDPE piping with heat fusion joints. Experience shall include a minimum of two projects within the past 4 years of at least 5,000 lineal feet with fittings from 3/4-inch up to 4-inch sizes that included the following duties:
 - (a) Socket, butt, and sidewall fusion techniques.
 - (b) Overseeing pipe layout and handling, heating temperature calibration, and visual joint inspection.
 - (c) Performing purge and pressure testing.
 - (d) Minimum of 50 fusion joints each of 3/4-inch, 1-inch, 1-1/4-inch, 1-1/2-inch, 2-inch, and 4-inch piping.

- e. Heat Fusion Technician Certification: Training and certification, certified within two years from the date of project commencement.

700-1.5 DELIVERY, STORAGE, AND HANDLING.

- a. Deliver piping and fittings to project site in shipping containers with labeling in place.
 - (1) Comply with local and state regulations.
 - (2) Verify that labels on piping indicate manufacturer's name, pipe or tube size, and PE cell classification.
 - (3) Verify that piping complies with specifications and is undamaged.
- b. Protect from weather, humidity and temperature variations, dirt and dust, and other environmental contaminants. If contaminated, clean immediately and store as required.
- c. Store piping capped or plugged until time of installation.

700-1.6 PERFORMANCE REQUIREMENTS

- a. **Ground-Loop, Heat-Pump Piping.** Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
 - (1) **Piping in boreholes.** 160 psig at 73F water temperature.
 - (2) **Horizontal piping and appurtenances.** 100 psig at 73F water temperature.

- b. All work shall be performed in accordance with the 2009 International Building Codes, State of Alaska regulations including Mechanical Administrator requirements, and City and Borough of Juneau requirements. An Alaska licensed Mechanical Administrator is required to supervise the mechanical work.
- c. The loopfield contractor shall comply with the materials, standards, and accepted installation practices of the International Ground Source Heat Pump Association (IGSHPA) as well as all state and local regulations pertaining to the installation.
- d. **Warranty.** The loopfield piping, including the vertical u-bend assemblies, shall be warranted for a period of one year from substantial completion against manufacturing and/or installation defects. The piping shall be repaired during this period at no cost to the owner. Failure of no more than one U-bend assembly at either site may be repaired by capping and abandoning the u-bend assembly. Additional u-bend failures shall be repaired or replaced. Damage to the piping system by digging or drilling equipment and earthquakes are not covered under this warranty.

700-1.7 ENVIRONMENTAL

- a. Aquifers shall be protected and reported per State of Alaska requirements.
- b. Use environmentally safe oils and lubricants during drilling that are specifically intended for sites with groundwater near the surface.
- c. Carefully monitor fuel transfers. Remediate any spills, leaks or discharges immediately.
- d. Use only potable water for make-up of drilling fluids or grouts. Potable water is available from the water hydrants located within 300' of the loopfield. Connect to the hydrant with a backflow preventer and water meter assembly that shall be obtained from the Juneau Water Department. Provide all materials and pay all costs for connecting to the hydrant and water use.
- e. Use NFS approved, environmentally safe drilling fluids or drilling fluid additives.
- f. Dispose of the drilling fluids, cuttings, and spoils in accordance with regulations. On-site disposal is acceptable if permitted by state and local codes and all products used in the drilling operation are environmentally safe.

700-1.8 EXISTING GEOTECHNICAL DATA

- a. See Civil documents for geotechnical data at the site.
- b. Juneau Airport Terminal vertical borehole loopfield installed in 2009 borehole data.

(1)	Sand and gravel:	0'-6'
(2)	Gravel, 2-inch minus with some silt matrix:	6'-57'
(3)	Sand with some silt and occasional wood	57'-170'
(4)	Interblended sandy silt/silty sand:	170'-320'

700-1.3 REFERENCE STANDARDS.

- | | |
|----------------|---|
| 49 CFR 192.285 | Plastic Pipe: Qualifying Persons to Make Joints; current edition. |
| APHA (EWWW) | Standard Methods for the Examination of Water and Wastewater; American Public Health Association; 2008. |

ASHRAE (HVACA)	ASHRAE Handbook - HVAC Applications, Chapter 32, Geothermal Energy; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2011.
ASHRAE Item 90376	(1997): Ground-Source Heat Pumps, Design of Geothermal Systems for Commercial and Institutional Buildings.
ASTM A500 / A500M	10a Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM B88	Standard Specification for Seamless Copper Water Tube; 2009.
ASTM B280	Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2008.
ASTM D2447	Standard Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter; 2003.
ASTM D2683	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing; 2010.
ASTM D2837	Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products; 2011.
ASTM D3035	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter; 2010.
ASTM D3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing; 2010a.
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Material; 2010a.
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter; 2010.
ASTM F1055	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing; 2011.
IGSHPA (GROUT)	Grouting Procedures for GHP Systems; International Ground Source Heat Pump Association; 1991.
IGSHPA (GVERT)	Grouting for Vertical GHP Systems; International Ground Source Heat Pump Association; 2000.
IGSHPA (INSTALL)	Closed-Loop/Ground-Source Heat Pump Systems: Installation Guide; International Ground Source Heat Pump Association; 2009.
NFPA 704	Standard System for the Identification of the Hazards of Materials for Emergency Response; National Fire Protection Association; 2007.
PPI TR4	PPI Listing of Hydrostatic Design Basis (HDB), Strength Design Basis, Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe; Plastics Pipe Institute; 2011

MATERIALS

700-2.1 HEAT EXCHANGER.

- a. The ground-coupled heat exchanger has been designed; CONTRACTOR is responsible for execution as required in the Contract Documents.
- b. **Heat Exchanger Configuration.** Closed system; polyethylene piping in vertical boreholes located adjacent to building, as indicated on drawings.
 - (1) Pipe Diameter: 3/4 inch.
 - (2) Borehole Depth: 300 feet.
 - (3) Borehole Diameter: 6 inches.
 - (4) Borehole Spacing: 20 feet, minimum.
 - (5) Total Number of Boreholes: 144.
- c. **Heat Exchanger Performance.**
 - (1) Heat Transfer Capacity for Heating: 1,560,000 Peak Btuh.
 - (2) Maximum Working Pressure: 160 psig.
 - (4) Design Operating Pressure: 30 psig.
 - (5) Minimum Winter Temperature of Fluid (Winter Inlet Temperature): 30 degrees F.
 - (6) Maximum Summer Temperature of Fluid (Summer Inlet Temperature): NA degrees F.

700-2.2 PIPING APPURTENANCES.

- a. **Locating Tape.** Foil backed, two inches wide or greater, with a continuous message printed every 36 inches or less reading: "CAUTION GEOTHERMAL PIPELINE BURIED BELOW". Highly resistant to alkalis, acids, and other destructive agents found in the ground.
- b. **Extruded Polystyrene Board Insulation (XPS).** Extruded polystyrene (XPS) closed cell foam panels 2-inch thick with continuous extruded skin on the face and back surfaces, conforming to the minimum physical requirements of ASTM C-578, Type V. Compressive strength of 100 psi. Minimum R Value of 10 for a 2-inch thick panel. Equal to Owens-Corning XPS series.
- c. **Buried Piping Insulation.** Closed cell, elastomeric foam pipe insulation. 1" thick with self-sealing longitudinal joints. For use on buried piping. ASTM C 534 Type 1 – Tubular Grade 1. Thermal conductivity of 0.25 BTU-in/hr ft² °F in accordance with ASTM C 177. Equal to AP Armaflex SS.

700-2.3 DRILLING FLUIDS. Use drilling fluids that comply with state and local codes and apply in accordance with the manufacturer's recommendations. Use clays of the commercially process type that meet or exceed American Petroleum Institute's Standard 13-A for Drilling Fluid Materials. All drilling fluids shall be approved by the National Sanitation Foundation (NSF).

700-2.4 BOREHOLE PIPE. High density polyethylene pipe, type PE3408, PE3608, or PE4710, with minimum ASTM D3350 cell classification of PE345364.

- a. **Pipe Used in Vertical Bore Applications.** Comply with ASTM D3035 with minimum working pressure rating of 160 psi at 73F. Minimum dimension ratio (SDR) of 11.
- b. **Other Pipe of 3 Inches Diameter and Larger.** Comply with ASTM D3035 or ASTM F714, with minimum working pressure rating of 100 psi, or ASTM D2447 Schedule 40.

- c. **Other Pipe 1.25 Inches But Less Than 3 Inches In Diameter (Nominal).** Comply with ASTM D3035 with minimum working pressure rating of 110 psi, or ASTM D2447 Schedule 40.
- d. **Other Pipe Less Than 1-1/4 Inches in Diameter (Nominal).** Comply with ASTM D3035 with minimum working pressure rating of 160 psi.
- e. **Long Term Hydrostatic Design Basis.** 1600 psi at 73 degrees F, when tested in accordance with ASTM D2837; appropriate listing in current edition of PPI TR-4 will constitute evidence of compliance with this requirement; otherwise, submit independent test results.
- f. **U-Bend Assembly.** Provide factory fabricated and fused u-bend assemblies. Provide assembly of sufficient length to reach grade from the bottom of the bore with no joints in the borehole other than at the u-bend.
 - (1) Constructed of manufactured u-bend fittings, minimum SDR 9 and 200 psi ratings. Do not use L+Street elbows. Manufacturers include Phillips and Enlink.
 - (2) Factory embossed depth stamp every 36 inches from u-bend.
- g. **Joints and Fittings.** Polyethylene of same type as pipe, of sizes and types suitable for the pipe being used; use only heat fusion or stab-type mechanical fittings that are quality controlled to provide a leak-free union between piping ends that is stronger than the piping itself. Do not use other barbed fittings or hose clamps.
 - (1) Electrofusion Type Fittings: Comply with ASTM F1055.
 - (2) Butt Fusion Fittings: Comply with ASTM D3261.
 - (3) Socket Type Fittings: Comply with ASTM D2683.
 - (4) Where threaded fittings must be used for connection to equipment or dissimilar piping, use fittings and thread sealant compatible and effective with antifreeze used.

Each pipe shall be permanently indent marked with the manufacturer's name, nominal size, pressure rating, relevant ASTM standards, cell classification number and date of manufacture.

Each pipe shall be permanently indent marked with length of piping in feet for purposes of verifying field lengths.

700-2.5 CASING PIPE. Carbon steel piping meeting ASTM A500 cold formed welded and seamless carbon steel tubing, 6-inch diameter, Nominal Schedule 20/minimum wall thickness of 0.188 inches. For use in casing geothermal boreholes.

700-2.5 TEMPORARY HEAT EXCHANGE FLUID. Water, future will be anti-freeze mixture added to loopfield in another project.

700-2.6 BACKFILL FOR VERTICAL BOREHOLES. Bentonite.

- a. **Bentonite Chips.** 1/4" to 3/8" bentonite granules or chips (100% passing a 3/8" screen, but 100% retained on a 1/4" screen) of a naturally occurring montmorillonite with the specific characteristic of swelling in fresh water. Forms a permanent, flexible down-hole seal. A natural, unaltered mineral with no added chemicals or contaminants, non-toxic, and environmentally safe.
- b. **Bentonite Grout.** Bentonite grout mixture for pressure grouting and sealing the bore hole of the vertical well. The grout selected shall meet ANSI/NSF Standard 60 and all local and state rules and regulations.
 - (a) Thermo conductivity of 0.76 Btu/hr-ft-F or greater.
 - (b) Minimum solids content of 59.5%.
 - (c) The target grout weight 10 lb/gallons to 15 lb/gallon.

- c. **Cement Grout.** 3000 psi concrete, 28 day compressive strength, air entrained. Conforming to ASTM C94 for ready mixed concrete.

700-2.6 GRAVEL FOR BOREHOLE DRILLING. Clean, washed material with the following classification:

% Passing	Sieve Size
100%	3/8"
85% to 100%	#4 sieve
0%-1%	#200 sieve

CONSTRUCTION REQUIREMENTS

700-3.1 GENERAL

- a. Conduct a Pre-Installation conference at the site prior to start of Work to review execution procedures including airfield safety and security measures.
- b. Examine areas and conditions under which ground heat exchanger systems will be installed. Prior to excavation, trenching, or drilling, locate and mark buried utilities. Prior to drilling or trenching, provide a utility locate of all underground utilities. Existing utility lines uncovered during excavation shall be protected from damage during excavation and backfilling.
- c. Excavating, trenching, and backfilling are specified in P-152 Excavation and Embankment.
- d. Maintain records onsite including the depth and boring log of each borehole and the depth of the u-bend assembly.
- e. Provide fittings for changes in direction only when the minimum bend radius is not possible. Sharp bends and mitered joints shall not be used in piping. When pipe bends are required, use radius type elbows.
- f. Make changes in piping sizes through tapered concentric fittings. Leaks shall be "cut-out" and repaired in accordance with the pipe manufacturer's recommendations. Direct buried threaded or flanged connections are not permitted.
- g. Installation shall follow IGSHA guidelines as well as local, state, and Federal guidelines and regulations. Upon delivery of piping, inspect the pipe for damage and verify that the pipe meets the project specifications. Do not use the pipe if it has a cut or a gouge that is more than 10 per cent of the minimum wall thickness of the pipe.

700-3.2 VERTICAL PIPING INSTALLATION

- a. **Test Borehole.**
 - (1) Within 24 hours of starting work, install a pressure gage on the existing U-bend assembly and perform a pressure test.
 - (2) Verify to the Owner that the piping holds 100 psig of pressure without leaking for 60 minutes. After testing, maintain the u-bend at 50 psig of pressure until it is connected to the loopfield piping.

b. Boreholes.

- (1) Borefield layout and alignment shall be in accordance with the drawings.
- (2) Boreholes: During installation of the vertical bore, maintain a water and soils log. Take into consideration the likelihood that the boreholes will have standing water within 5' of grade. The log shall indicate depth of water encountered, materials encountered, depth intervals of materials and physical description. If water is encountered, indicate in the log the depths at which it was encountered, and the static water level. Include in the log the type of drill rig used, the actual drilling time to complete the bore hole.
- (3) Vertical bores shall be 5 feet deeper than the length of the U-bend assembly loop and shall be clean and of sufficient diameter to facilitate the installation of the U-bend assembly. Limit the borehole diameter to six inches. If a larger diameter is required, it must be approved by the design engineer.
- (4) Install casing for the first 40 feet in depth.
- (5) The borehole shall be constructed as indicated. Where any discrepancy exists between local and state codes, regulations, and requirements and this specification, the more stringent requirement applies.
- (6) Use reasonable and prudent care to protect the piping from crushing, cuts, or kinking.
- (7) Contain and retain drilling fluids to prevent uncontrolled flow away from the loopfield.

c. U-bend Pipe Assembly.

- (1) Each U-bend loop shall be factory assembled with all joints made by heat fusion. There shall be no joints in the u-bend assembly except for the factory assembled connection at the U-bend.
- (2) Pressure test the U-bend in accordance with IGSHPA 21020 recommended procedures. Fill the u-bend with water and top with air. Pressurize at 100 psi and verify that tube holds pressure without a drop for 30 minutes before and after insertion in the borehole. U-bends that leak shall not be used; remove from the site that day. Submit a pressure test report for all U-bend assemblies.
- (3) Maintain the water-filled loop at a minimum of 50 psi to prevent the pipe from being crushed by backfill material. Temporarily cap the ends of the U-bend assemblies until the actual testing begins. The cap shall be fused to the pipe end in order to hold the pressure.
- (4) Install piping in boreholes according to ASTM D2774 or ASTM F645. When inserting the U-bend assembly into the bore hole, use the depth graduations as a means of verification of depth of the bore hole.
- (5) If needed, a smooth steel bar may be secured to the u-bend assembly prior to lowering it into the borehole. Securely tape the bar to the u-bend assembly at 24" on center to support the bar without pulling on the u-bend fitting or damaging the assembly.

d. Backfill Procedure.

- (1) Install the u-bend assembly and backfill the borehole, including the surface seal, within 24 hours of achieving total depth of the borehole.
- (2) Backfill boreholes in accordance with the IGSHPA 21010.

- (3) Slowly place grout into the borehole starting at the bottom in a controlled manner that minimize voids and bridging of the material as it fills the borehole.
- (4) Install the surface seal as detailed and in accordance with IGSHPA 21015.
 - (a) Bentonite Chips: Pour directly into the borehole in accordance with manufacturer's instructions.
 - (b) Bentonite Grout or Cement
 - 1) Mix grout in accordance with the manufacturer's instructions.
 - 2) Place grout or cement by pressure pumping through a tremie pipe lowered to the bottom of the grout plug and raised slowly as grout is added. Place in accordance with the IGSHPA installation manual. Work quickly to assure that there are no air voids forming as a result of the placing.
 - 3) Emplace grout or cement in a continuous motion upward to the top.

700-3.3 HEADERING PIPING INSTALLATION

a. Excavation and Backfilling for Piping.

- (1) Provide all excavating, backfilling, shoring, bailing and pumping for the installation of the work and perform necessary grading to prevent surface water from flowing into trenches or other excavations. Sanitary sewer lines shall not be used for draining trenches. All pipe and conduit ends shall be fusion sealed and lines left clean and unobstructed during construction. Only material suitable for backfilling shall be piled a sufficient distance from banks of trenches to avoid overloading. Unsuitable backfill material shall be removed as directed by the Owner.
- (2) Contractor has the option of trenching or removing material as needed to install the piping.
- (3) Provide sheathing, shoring, and dewatering equipment as necessary for protection of work and personnel safety. Remove rocks in trenches that could contact pipe.

b. Piping Installation.

- (1) The only acceptable method for joining buried pipe systems is by a heat fusion process performed in accordance with applicable standards. Work shall be performed in weather conditions acceptable to the fusion process. Inclement weather conditions may require additional means and measures to accomplish the work such as temporary tenting, shelter, and other means to prevent adversely affecting the Work.
- (2) Make joints while pipe is lying beside the trench. Install a base of 6 inches of pipe bedding before placing the pipe. After the piping is installed, tested, flushed, purged, inspected, and approved while still under pressure, backfill with pipe bedding as detailed. Complete backfill in accordance with IGSHPA 21020 recommended procedures. When laying pipe in trench, insure the bottom of the trench is smooth, free from rocks and debris. When laying pipe, use a fine to medium backfill to fill trench. If there are multiple pipes in the trench, insure each pipe is completely surrounded and supported with backfill before the next pipe is installed.
- (3) Minimize joints by using piping in rolls to the greatest extent possible.
- (4) Cut, assemble, and install piping in accordance with the pipe manufacturer's recommendations.

- (5) Install pipe bends with a minimum bend radius of 25 times the nominal pipe diameter or the pipe manufacturer's recommendations, whichever is greater.
- (6) Install all piping below the minimum depth shown on plans.
- (7) Install piping in accordance with the pipe manufacturers written instructions. Install PE piping in trenches in accordance with ASTM D2774 or ASTM F645.
- (8) Install piping mains on 18 inch centers.
- (9) Install GSHR piping, returning fluid to the building, generally higher than GSHS piping in the trench to allow for air entrained to move in the direction of flow and towards air vents at the manifold.
- (10) Sand bags or other approved blocking can be used for holding pipe mains in place prior to testing and backfill.
- (11) Perform all testing required prior to backfill. See Section 3.4 Field Quality Control.

c. Connect the headering piping as indicated on the plans.

- (1) The design accounts for balanced flow, minimal pressure drop, and flushing and purging the piping system. No variations are allowed in the circuit hookup or the pipe sizes without approval from the design engineer.
- (2) Construct headering piping to IGSHPA standards to facilitate equivalent flow through each borehole, minimum pressure drop, and air purging. All piping lengths and fittings for each borehole branch shall be equivalent to maintain fluid flow balance.

d. Joints and Fittings.

- (1) Piping components shall be joined by a heat fusion method that conforms to the piping manufacturer's recommendation for this application. During installation, keep trash, soil, and foreign objects out of the pipe. Fusion cap ends of the pipe until the pipe is joined to the circuit.
- (2) Join individual borehole piping to feed mains using branch saddles with socket receivers. Completely remove the cutout on the saddle tees.
- (3) Use bell reductions at pipe reductions. Use reducing socket tees when fabricating socket type reducing headers. Avoid sharp bends and mitered elbows and bends in piping. Consult pipe manufacturer for minimum bend radius. Install elbow fittings at changes in pipe direction that are tighter than the minimum recommended bend radius.
- (4) Heat Fusion Process: Clean PE pipe and fittings and make heat-fusion joints by socket, butt or saddle (sidewall) fusion in accordance to ASTM D2610, ASTM D2683 and the manufacturer's heat fusion specifications. Use butt fusion joints for pipe greater than $\frac{3}{4}$ inches diameter. Different plastics or grades of plastic shall not be fused together. When fusing pipe, perform heat fusion tests to verify the quality of the joints.
 - (a) When fusing pipe, use a data logger and data collection device to record and document the heater temperature and fusion pressure profile over time of each joint. Submit the data as part of the field quality control data.
 - (b) At the beginning and for each time the fusion machine is adjusted for a different pipe size, a sample test joint with recorded data shall be performed and submitted to the inspector.

- (5) The Owner's representative may test joints by banging piping with a 2 pound rubber mallet to ensure soundness of joints.
- e. **Termination.** Terminate the headering piping as detailed. Perform flush, purge and flow tests. When testing is complete, keep each circuit filled with anti-freeze and pressurized to 50 psig, with all connections capped.
- f. **Insulation.** Provide pipe and rigid board insulation.
- (1) Pipe Insulation: Completely insulate piping mains and feed mains. Do not insulate branches to individual boreholes.
- (a) Apply firm and even pressure to close self-sealing longitudinal joints. Seal butt joints with manufacturer's recommended adhesive.
- (b) For fittings and elbows, cut and/or flex insulation around fitting and seal tight to pipe with adhesive or stainless steel bands.
- (c) Due to weather conditions temporary measures may be required to hold insulation in place and are to be approved by Engineer; water resistant tape over entire insulation joint to hold together, tie wraps, etc.
- (2) Board Insulation: Install continuous 2" thick board insulation over the top of each of the 3-inch piping mains, as detailed.
- (3) Install continuous detectable warning tape 18" above each underground pipe. Locate tape directly over piping.
- g. **Backfill.** Backfill the piping after field quality control is completed.
- (1) Prior to backfill record and complete as-built survey, see 3.4 Field Quality Control for requirements.
- (2) Backfill piping to depth shown above pipe with pipe bedding material. Backfill and compact according to requirements in P-152 Excavation and Embankment.
- (3) Install continuous detectable warning tape 18" above each underground pipe. Locate tape directly over piping.

700-3.4 FIELD QUALITY CONTROL

- a. **Sequencing.** Perform field quality control of each piping circuit after installation is complete. Do not cover piping until the tests for the entire loopfield are completed successfully.
- b. **Flushing.** Purging and Flow Test
- (1) General
- (a) Perform in accordance with procedures recommended by IGSHPA 21020 and the following requirements.
- (b) Perform the following tests in the presence of the Owner. Notify Owner a minimum 2 days before flushing operation.
- (c) Provide all materials and labor required to perform the tests, including temporary connections and equipment.
- (2) Flushing and Purging
- (a) Flush each loopfield circuit with potable water to remove all dirt and debris. Flush at a minimum of 40 gpm, discharging the water to drain, until the flow is clear for 20 minutes.

This may be accomplished using the connection to city water main.

- (b) Connect the test pump and air separator, with clean strainer, as detailed. Fill the system to 30 psig, purging air as it is filled. Verify that the pressure gages on the loopfield supply and return mains show equal pressures.
- (c) Operate the pump, using the flow setter to increase flow gradually while purging air. Increase flow until it reaches the flow rate shown on the drawings, which will provide a velocity of 3 feet/sec in each U-bend assembly. Purge air and add makeup water as required to maintain 30 psig of pressure.
- (d) When most of the air is out of the system, set the flow setter to the flow rate indicated on the drawings. Purge air and blow-down the strainer every 5 minutes, adding makeup water as needed to maintain 30 psig of pressure. Allow purge pump to run 15 minutes after the last air bubbles have been removed.
- (e) Alternate means and methods of flushing and purging the piping may be utilized if approved by Engineer.

(3) Flow Test

- (a) Perform a flow test on each circuit to ensure system is free of blockage.
- (b) Set the flow setter to the flow rate indicated on the drawings. Record the loopfield pressure drop by measuring the pressure in the loopfield supply and return mains.

(4) Test Completion: Repeat the flush, purge, and flow tests until all circuits are clean and there are no blockages. A successful test has occurred when:

- (a) After the flow test, no dirt or debris is present when the air separator is blown down and the strainer is removed. If any dirt or debris is present, repeat the flush, purge, and flow test until no dirt or debris is present.
- (b) If the pressure drop in any circuit is 10% higher than another comparative circuit or calculated values, locate the blockage using the manufacturer's recommendation, remove the blockage, then repeat the flush, purge, and flow tests of the blocked circuit(s) until all pressure drops are within 10% of the lowest circuit and calculated values.

c. Hydrostatic Test. Perform after the flushing, purging and flow test. Provide the test in accordance with IGSHPA 21020 and the following requirements.

- (1) Fill piping 24 hours before testing and apply test pressure to stabilize piping. Use potable water only.
- (2) Pressurize the system to 25 psig. Hold the pressure steady and inspect each joint. Slowly increase pressure in 25 psig increments, holding for 30 minutes at each increment while inspecting joints. When pressure reaches 100 psig, hold for 60 minutes and inspect joints. After testing at maximum test pressure, reduce pressure to 25 psig (207 kPa). Hold for 90 minutes, measuring pressure at 30-minute intervals.
- (3) If there is any pressure loss or visible leakage during the testing, the leak shall be identified and repaired in accordance with the piping components manufacturer's recommendations. Test shall be repeated until there is no loss in pressure during the test period.

d. Completion.

- (1) Remove test equipment and cap all connections, retaining a residual pressure on the system of 50 psig, as shown on the pressure gage to remain connected to each circuit at the termination point.
- (2) Reports: Submit the following reports.

- (a) Borehole log for each borehole. Similar boreholes may be included on one log.
- (b) Site survey of piping and boreholes, with dimensions from established features.
- (c) Pressure test report for each U-bend assembly.
- (d) Flush and air purge report.
- (e) Hydrostatic test report.

(3) As-built Documentation

- (a) Prior to backfilling the piping trenches, prepare as-built documentation of the horizontal piping and each borehole.
- (b) Dimension the locations of all components of the loopfield on full size plans.
- (c) Indicate the depth of each u-bend assembly, and size and routing of all piping.
- (d) Include permanent features such as buildings, utilities, catch basins and manholes for horizontal control.
- (e) Submit as-built information on two full-size loopfield plans.

METHOD OF MEASUREMENT

700-4.1 This item will not be measured for payment. The Engineer's acceptance constitutes measurement.

BASIS OF PAYMENT

700-5.1 Payment will be made at the contract lump sum price for the completed and accepted job. This price will be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- Item U-700a Ground Loop, Horizontal Piping - per lump sum
- Item U-700b Extend Branch Mains - per lump sum