CONTRACT DOCUMENTS
AND
SPECIFICATIONS

For

Bid # 26-022

TAXIWAY BRAVO WEST RELOCATION

RICHARD B. RUSSELL REGIONAL AIRPORT
FLOYD COUNTY, GEORGIA

June 2026

Prepared By:

CRAWFORD, MURPHY & TILLY, INC.
Engineers and Consultants
Atlanta, GA

VOLUME 1 – CONTRACT DOCUMENTS

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FLOYD COUNTY BOARD OF COMMISSIONERS
PURCHASING DEPARTMENT
#12 East 4th Ave. Ste. 106
ROME, GA 30161
(706) 291-5118 FAX (706) 290-6099

Date Issued: June 2, 2026
Bid Number: 26-022

NOTICE OF LETTING CONTRACT
INVITATION FOR BIDS
RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
BID # 26-022

To Whom It May Concern:

Notice is hereby given that Floyd County, Georgia proposes to let a Contract to the lowest responsive, responsible bidder, upon sealed bids, for the furnishing of all labor, material, equipment, and other things necessary for the construction of the:

TAXIWAY BRAVO WEST RELOCATION
RICHARD B. RUSSELL REGIONAL AIRPORT
304 Russell Field Road
Rome, Georgia 30165

Potential Bidders must register and submit bids at https://floydcountyga.bonfirehub.com.

Sealed bids will be received via BonFire **until 2:00 pm (local time), on Tuesday, June 30, 2026**, at the office of the Floyd County Purchasing Director, located in the Floyd County Administration Building, 12 East Fourth Avenue, Suite 106, Rome, Georgia 30161. Bids will then and there be publicly opened and read aloud in the office of the Purchasing Director. Late bids will not be accepted.

TAXIWAY BRAVO WEST RELOCATION: The project primarily includes the performance of full-depth asphalt pavement removal and new asphalt pavement construction along a new alignment, including re-grading of the adjacent taxiway safety areas and object free areas to meet design standards, as well as to facilitate positive drainage and stormwater management within the project limits. The scope of work generally includes removal and replacement of asphalt pavements and drainage infrastructure, including associated grading and drainage improvements and installation of new taxiway lighting and signage improvements, as well as erosion control measures, pavement marking, and site restoration.

PRE-BID CONFERENCE AND SITE VISIT will be held **at 2:00 pm (local time) on Thursday, June 11, 2026** at the Airport Terminal Conference Room, 304 Russell Field Road, Rome, GA 30165. Site visit will follow.

The work is to be let in one contract and shall conform in all respects to the Specifications of Crawford, Murphy & Tilly, Inc., located at 3330 Cumberland Boulevard SE, Suite 125, Atlanta, GA 30339.

The Contract Documents may be examined at the following location(s):

Office of the Engineer: Crawford, Murphy & Tilly, Inc.
3330 Cumberland Boulevard SE, Suite 125
Atlanta, GA 30339.
(470) 314-0776

Airport Administration Office: Russell Regional Airport
304 Russell Field Road NE
Rome, GA 30165
(706) 295-7835

Office of the Airport Owner: Floyd County Board of Commissioners
County Purchasing Office, Suite 106
#12 East Fourth Ave.
Rome, GA 30161
(706) 291-5109

An Electronic Version of the Bidding and Contract Documents may be obtained via **BonFire** at https://floydcountyga.bonfirehub.com.

All forms, certifications and compliance documents required by Floyd County must accompany each bid. Including, but not necessarily limited to, compliance with the Georgia Security and Immigration Compliance Act OCGA 13-10-90 et.seq. Contractor must complete and submit with bid, the Contractor Affidavit under OCGA 13-10-91(b)(1) included with contract documents. Be advised that bid will not be read or accepted if this document is not submitted at time of bid.

A qualified interpreter for the hearing impaired is available upon request at least 10 (ten) days in advance of the bid opening date. Please call (706) 613-3072 ext. 1023 for more information for the hearing impaired. This service is in compliance with the Americans with Disabilities Act (ADA).

MINORITY BUSINESS ENTERPRISE POLICY STATEMENT: It is the policy of Floyd County, Georgia to provide fair and reasonable opportunities for participation by Minority Business Enterprises (MBE). Floyd County encourages these firms to compete and encourages non-minority firms to provide for the participation of MBE firms through partnerships, joint ventures, subcontracts, and other contractual opportunities.

Bids must be accompanied by a Bid Bond in an amount of not less than five percent (5%) of the base bid. All bonds must be signed or countersigned by a Georgia Resident Agent.

A Performance Bond in the amount of one hundred percent (100%) of the amount of the bid, and a Labor Materials Payment Bond in the amount of not less than the amount of said Bid, one hundred percent (100%), shall be furnished by the successful bidders.

The right is reserved to the Board of Commissioners of Floyd County, Georgia to delay the award of the Contract for a period not to exceed one hundred twenty (120) days from the date of opening of bids, during which time bids shall remain open and not subject to withdrawal. The right is also reserved to the Board of Commissioners of Floyd County, Georgia to reject any and all bids and to waive any and all technicalities or informalities. Any contract executed pursuant to this notice shall be binding upon the Board of Commissioners of Floyd County, Georgia, as such, but will not create a liability expressed or implied, against any members of the Board of Commissioners of Floyd County, the Chairman of the Board, or employee of said County, in his or her individual capacity.

Federal Provisions
This project is subject to the following Federal provisions, statutes and regulations:

Goals for Minority and Female Participation – 41 CFR Part 60 and Executive Order 11246:

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:	2.5%
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, 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.

4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is **Floyd County, Georgia.**

Buy American Certificate – Aviation Safety and Capacity Act of 1990: This contract is subject to the "Buy American Preferences" of the Aviation Safety and Capacity Act of 1990. Per Title 49 U.S.C. Section 50101, all steel and manufactured products installed under an AIP assisted project must be produce in the United States unless the Federal Aviation Administration has granted a formal waiver.

As a condition of bid responsiveness, Bidders must complete and submit as part of their proposal the enclosed Buy American certification. Bidder must indicate whether it intends to meet Buy America preferences by only installing steel and manufactured products produced with the United State of America; or if it intends to seek a permissible waiver to the Buy America requirements.

Title VI Solicitation Notice: The Floyd County Board of Commissioners, 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.

Davis-Bacon Act, as amended – 29CFR Part 5: The Contractor is required to comply with the wage and labor requirements and to pay minimum wages in accordance with the schedule of wage rates established by the United States Department of Labor and included in the contract documents.

Debarment, Suspension, Ineligibility, and Voluntary Exclusion – 49 CFR Part 29: The bidder certifies, by submission of this proposal or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. Individuals or companies listed in the General Services Administrations' "Excluded Parties Listing System" will not be considered for Award of Contract.

Disadvantaged Business Enterprise – 49 CFR Part 26: The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted contracts. In accordance with 49 CFR Part 26.45, the sponsor has established **a contract goal of 0.0% participation** for small business concerns owned and controlled by certified socially and economically disadvantaged enterprise (DBE). The goal is 0.0% pending the reevaluation of DBE firms in the State of Georgia.

Foreign Trade Restriction – 49 CFR Part 30: The Bidder and Bidder's subcontractors, by submission of an offer and/or execution of a contract, is required to certify that it:

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 published by the Office of the United States Trade Representative (USTR);

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

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

Lobbying and Influencing Federal Employees – 49 CFR Part 20: Contractors that apply or bid for an award of $100,000 or more must certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or another award covered by 31 USC 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award.

Procurement of Recovered Materials – 40 CFR Part 247: Sponsors of AIP funded development and equipment projects must comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. Section 6002 emphasizes maximizing energy and resource recovery through use of affirmative procurement actions for recovered materials identified in the Environmental Protection Agency (EPA) guidelines codified at 40 CFR part 247. When acquiring items designated in the guidelines, the sponsor must procure items that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition

FULL BID PACKAGE MUST BE RETURNED IN SEALED PACKAGE
Bids will be marked/titled/labeled as follows

TAXIWAY BRAVO WEST RELOCATION

Tuesday, June 30, 2026 – 2:00 PM

BID # 26-022

RANDY E. SELF, MBA
PURCHASING DIRECTOR

Legal ad run: June 5th, 2026, and June 19th, 2026

DIVISION 2 - BIDDING DOCUMENTS

INSTRUCTIONS TO BIDDERS

GENERAL

Sealed Bids will be received at the office of the Floyd County Purchasing Director, located in the Floyd County Administration Building, 12 East Fourth Avenue, Suite 106, Rome, Georgia 30161 until **Tuesday, June 30, 2026, at 2:00 PM** for construction of the **Taxiway Bravo West Relocation** project according to Drawings and Specifications entitled **" Taxiway Bravo West Relocation"** on file at the locations as noted in the Advertisement for Bids. Bids will be considered only from experienced and well-equipped contractors. Prior to beginning construction, the Successful Bidder will file with the Airport Owner, a Contract Performance Bond, and a Payment Bond, each equal to 100% of the Contract Price, with the terms and surety to be approved by the Airport Owner; and furnish satisfactory proof of carriage of the insurance required.

Construction must begin within 10 days from the date of receipt of the Notice to Proceed, as evidenced by official receipt of certified mail or acknowledgement of personal delivery and must be completed within the allotted time of **Two Hundred Forty (240) consecutive calendar days**, from and including the date of receipt of such notice.

Refer to Section 01010, Summary of Work, for specific requirements as to the sequence of construction and time restraints.

SUBMITTING BIDS

Bids are to be submitted on the proper forms furnished by the Airport Owner, Floyd County Board of Commissioners. Bids are submitted via the Bonfire website, https://floydcountyga.bonfirehub.com. The proposal shall be on the "Bid Submittal Forms Package" provided. No other forms are acceptable.

The Bidder's envelope shall contain the signed original of the following documents as well as one copy of the signed originals:

- Contract Proposal
- Schedule of Prices
- Bid Guaranty – Certified Check or Bid Bond
- Bidders Declaration
- Certificate of Non-Collusion
- Certificate of Non-Discrimination
- Drug-Free Workplace Certificate
- E-Verify Contractor Affidavit
- Statement of Qualifications
- Buy America Certification
- Proposed Sub-Contractor Information
- Certification Regarding Debarment
- Prohibition of Segregated Facilities
- Certification Regarding Tax Delinquency and Felony Convictions
- Certification Regarding Trade Restriction
- Certification Regarding Foreign Participation
- Certification of Eligibility – Davis Bacon Act
- Equal Opportunity Report Statement
- Certification Regarding Lobbying
- Preliminary Contractor Project Schedule
- IRS Form W-9

AUTHORITY TO SIGN

If a Bid is made by an individual, the name and mailing address must be shown. If made by a firm or partnership, the name and mailing address of each member of the firm or partnership must be shown. If made by a corporation, the Certificate of Corporate Bidder must be executed. A post office box is not acceptable to the **Floyd County Board of Commissioners** as a mailing address.

The Bidder should ensure that the legal and proper name of his proprietorship, firm, partnership, or corporation is printed or typed in the space provided on the Bid Form.

GUARANTEE TO ACCOMPANY PROPOSAL

Bids must be accompanied by a cashier's check or acceptable Bid Bond in an amount of not less than five percent of the total amount bid.

RIGHTS RESERVED

The Airport Owner reserves the right to reject any or all bids, to waive informalities and to re-advertise. It is understood, and all bids are made subject to this agreement, that the Airport Owner reserves the right to decide which bid is deemed lowest and best, and in arriving at this decision, full consideration will be given to the reputation of the Bidder, his financial responsibility, work of this type successfully completed, and availability of funds.

For consideration as a responsible bidder, the proposed bidder shall have been the general contractor engaged in construction of facilities of similar character for the least five years. Bidder may be required to submit evidence setting forth qualifications which entitle him to consideration as a responsible bidder. A list of work of similar character successfully completed within the last two years may be required giving the location, size, and listing equipment available for use on this Work.

Any unauthorized additions, conditions, limitations, or provisions attached to the Bid shall render it informal and may be cause for rejection. The Airport Owner reserves the right to waive informalities.

No bids may be withdrawn after submission of Bid **for a period of One Hundred Twenty (120) days** after the date set for opening thereof.

AWARD OF CONTRACT

The Contract, if awarded, will be awarded to that responsible bidder whose bid will be most advantageous to the Airport Owner, price and other factors considered. The Airport Owner is to make the determination.

The Contract between the Airport Owner and the Contractor shall be executed on the form attached, will be subject to all requirements of the Contract Documents, and shall form a binding contract between the contracting parties.

A Contract Performance Bond and Payment Bond, each equal to 100% of the Contract Price with a surety company satisfactory to the Airport Owner, must be provided by the successful Bidder by a surety company listed in the Federal Register and licensed to write surety insurance in the State of Georgia. Bonds given shall meet the requirements of the law of the State of Georgia including but not limited to O.C.G.A. §§36-10-4, 13-10-1, and 36-82-101 et seq.

The Contractor shall be required to furnish the Airport Owner with satisfactory proof of coverage of the insurance specified in the General Provisions.

If the Contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Airport Owner indicates that the Award will be in the best interest of the Airport Owner.

If a Contract is to be awarded, the Airport Owner will give the Successful Bidder a Notice of Award **within One Hundred (120) days** after the day of Bid Opening.

FAILURE TO EXECUTE CONTRACT

If the Successful Bidder, after having been notified of the acceptance of his Bid, fails to provide within the specified time, the required Payment and Performance Bonds, Certificates of Insurance, and to sign the Contract, the amount of the Bid Bond shall be paid over to the Airport Owner as liquidated damages as costs of the bidding procedure. The acceptance of the payment of the Bid Bond shall not operate to bar any claim the Airport Owner might otherwise have against the Bidder and the Airport Owner shall be authorized to pursue any claim against the Bidder for failure to consummate the Contract as may be authorized by law.

LOCATION AND SITE

The site of the proposed Work is at the stated location(s) within **Floyd County, Georgia.**

The Contractor shall accept the site in its present condition and carry out all Work in accordance with the requirements of the Specifications and as shown on the Drawings.

Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions at or contiguous to the site or other-wise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

On written request from the Bidder to visit the site, the Airport Owner will make arrangements to provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Access to the site and testing procedures will be by written permission from the Airport Owner at times specified by the Airport Owner.

The Contract Documents contain the provisions required for the completion of the Work to be performed pursuant to this Contract. Information obtained from an officer, agent, or employees of the Airport Owner, or any other person, shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the Contract. Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to so familiarize himself shall in no way relieve any Bidder from any obligation in respect to his bid.

The Contractor shall inspect all easements and rights-of-way to ensure that the Airport Owner has obtained all land and rights-of-way necessary for completion of the Work to be performed pursuant to the Contract Documents. The Contractor shall comply with all stipulations contained in easements acquired by the Airport Owner.

The Contractor shall not be entitled to damages for the failure of the Airport Owner to obtain rights-of-way. The Contractor shall accurately locate above and below ground utilities and structures which may be affected by the Work using whatever means may be appropriate.

ADDENDA AND INTERPRETATION

No interpretation of the meaning of the Contract Documents will be made orally to any Bidder. Every request for such interpretation should be in writing addressed to the Engineer. Each such interpretation shall be given in writing, separately numbered and dated, and furnished to each interested Bidder in sufficient time that all interested parties can be notified, the Airport Owner to be the sole determiner of time. Any request not received in time to accomplish such interpretation and distribution shall not be accepted.

ACKNOWLEDGEMENT OF ADDENDA

Addenda may be issued in response to changes in the Invitation to Bid. Addenda must be acknowledged by signing and returning the Addendum form. Acknowledgements must be received no later than the bid opening time and date. Failure to properly acknowledge any addendum may result in a declaration of non-responsiveness by the Airport Owner.

INFORMATION

Should a need for information arise, it should be directed to the Engineer who may be contacted at Crawford, Murphy & Tilly, Inc., Attn: Jake Marshall, via email at jmarshall@cmtengr.com, and Mike Reiter, via e-mail at mreiter@cmtengr.com, during the hours of 8:00 a.m. and 5:00 PM (local time), Monday through Friday, or via the BonFire website. **The deadline for requests for information or questions is 4:00 PM (local time) on Thursday, June 18th, 2026.**

PRE-BID CONFERENCE

A non-mandatory informational pre-bid conference and site visit will be held **at 2:00 PM (local time) on Thursday, June 11th, 2026,** at the Airport Terminal Conference Room, 304 Russell Field Road, Rome, GA 30165. Site visit will follow.

TIME AND LIQUIDATED DAMAGES

Provisions for Liquidated Damages are set forth in the Contract Form.

EEO CLAUSE - During the performance of this contract, the Contractor agrees as follows:

a) The Contractor will not discriminate against any employees or applicants 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, 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.

b) 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 consideration for employment without regard to race, color, religion, sex or national origin.

c) 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.

d) 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.

e) 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.

f) 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.

g) The Contractor will include that 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.

DISADVANTAGED BUSINESS ENTERPRISE (DBE)

The requirements of 49 CFR Part 26, Regulations of the U.S. Department of Transportation, apply to this contract. It is the policy of the Owner to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. All firms qualifying under this solicitation are encouraged to submit bids/proposals. Award of this contract will be conditioned upon satisfying the requirements of this bid specification. These requirements apply to all bidders, including those who qualify as a Disadvantaged Business Enterprise.

Pursuant to 49 C.F.R. § 26.111 and the requirements of the Interim Final Rule, the Georgia Department of Transportation is currently conducting a mandatory reevaluation of all previously certified DBE firms under the revised, race- and sex-neutral eligibility standards set forth in 49 C.F.R. § 26.67. Until that reevaluation is complete, the Owner is not authorized to establish DBE contract goals or to count DBE participation toward any overall DBE goal. Accordingly, no DBE contract goal applies to this solicitation.

Bidders and proposers are not required to solicit DBE participation or submit DBE utilization documentation as a condition of bid responsiveness or contract award for this solicitation.

Although no contract goal has been established, the Owner encourages all firms, including small businesses and those owned by socially and economically disadvantaged individuals as defined under 49 C.F.R. § 26.67, to participate in this contract through DBE-neutral means. The Owner is committed to providing equal opportunity in contracting and to facilitating the participation of all qualified businesses in its federally assisted programs.

COMPLETE FOR BID

CONTRACT PROPOSAL

TO: Floyd County Board of Commissioners (Owner)

The undersigned, in compliance with the request for bids for construction of: **Taxiway Bravo West Relocation**; hereby proposes to furnish all labor, permits, material, machinery, tools, supplies and equipment to faithfully perform all work required for construction of the Project in accordance with the project manual, project drawings and issued Addenda within the specified time of performance for the following prices: (see Schedule of Prices).

1. ACKNOWLEDGEMENTS BY BIDDER

a. By submittal of a proposal, the BIDDER acknowledges and accepts that the quantities established by the OWNER are an approximate estimate of the quantities required to fully complete the Project and that the estimated quantities are principally intended to serve as a basis for evaluation of bids. The BIDDER further acknowledges and accepts that payment under this contract will be made only for actual quantities and that quantities will vary in accordance with the General Provisions.

b. The BIDDER acknowledges and accepts that the Bid Documents are comprised of the documents identified within the Instructions to Bidders. The BIDDER further acknowledges that each the individual documents that comprise the Bid Documents are complementary to one another and together establishes the complete terms, conditions and obligations of the successful BIDDER.

c. As evidence of good faith in submitting this proposal, the undersigned encloses a bid guaranty in the form of a certified check or bid bond **in the amount of five percent (5%)** of the bid price. The BIDDER acknowledges and accepts that refusal or failure to accept award and execute a contract within the terms and conditions established herein will result in forfeiture of the bid guaranty to the owner as a liquidated damage.

d. The BIDDER acknowledges and accepts the OWNER'S right to reject any or all bids and to waive any minor informality in any Bid or solicitation procedure.

e. The BIDDER acknowledges and accepts the OWNER'S right to hold all Proposals for purposes of review and evaluation and not issue a notice-of-award for a period **not to exceed One Hundred Twenty (120) Calendar Days** from the stated date for receipt of bids.

f. The undersigned agrees that upon written notice of award of contract, he or she will execute the contract **within Twenty-one (21) Calendar Days** of the notice-of-award and furthermore and provide executed payment and performance bonds **within Seven (7) Calendar Days** from the date of contract execution. The undersigned accepts that failure to execute the contract and provide the required bonds within the stated timeframe shall result in forfeiture of the bid guaranty to the Owner as a liquidated damage.

g. Time of Performance: By submittal of this proposal, the undersigned acknowledges and agrees to commence work **within Fourteen (14) Calendar Days** of the date specified in the written "Notice-to-Proceed" as issued by the OWNER. The undersigned further agrees to complete the Project **within Two Hundred Forty (240) Consecutive Calendar Days** from the commencement date specified in the Notice-to-Proceed.

h. The undersigned acknowledges and accepts that for each and every Calendar Day the project remains incomplete beyond the contract time of performance, the Contractor shall pay the non-penal amount **of $1,500.00 per Calendar Day** as a liquidated damage to the OWNER.

i. The BIDDER, by submission of a proposal, acknowledges that award of this contract is subject to the provisions of the Davis-Bacon Act. The BIDDER accepts the requirement to pay prevailing wages for each classification and type of worker as established in the attached wage rate determination as issued by the United States Department of Labor. The BIDDER further acknowledges and accepts their requirement to incorporate the provision to pay the established prevailing wages in every subcontract agreement entered into by the Bidder under this project.

j. Compliance Reports (41 CFR Part 60-1.7): Within 30 days after award of this contract, the Contractor/Subcontractor shall file a compliance report (Standard Form 100) if s/he has not submitted a complete compliance report within 12 months preceding the date of award. This report is required if the Contractor/Subcontractor meets all of the following conditions:

1. Contractors/Subcontractors are not exempt based on 41 CFR 60-1,5.
2. Has 50 or more employees.
3. Is a prime contractor or first tier subcontractor.
4. There is a contract, subcontract, or purchase order amounting to $50,000 or more.

2. REPRESENTATIONS BY BIDDER

By submittal of a proposal (bid), the BIDDER represents the following:

a. The BIDDER has read and thoroughly examined the bid documents including all authorized addenda.

b. The BIDDER has a complete understanding of the terms and conditions required for the satisfactory performance of project work.

c. The BIDDER has fully informed themselves of the project site, the project site conditions and the surrounding area.

d. The BIDDER has familiarized themselves of the requirements of working on an operating airport and understands the conditions that may in any manner affect cost, progress or performance of the work

e. The BIDDER has correlated their observations with that of the project documents.

f. The BIDDER has found no errors, conflicts, ambiguities or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.

g. The BIDDER is familiar with all applicable Federal, State and local laws, rules and regulations pertaining to execution of the contract and the project work.

h. The BIDDER has complied with all requirements of these instructions and the associated project documents.

3. ATTACHMENTS TO THIS BID

The following documents are completed, attached to and made a part of this Bid:

1. Contract Proposal.
2. Schedule of Prices.
3. Bid Guaranty – Certified Check or Bid Bond.
4. Bidders Declaration.
5. Certificate of Non-Collusion.
6. Certificate of Non-Discrimination.
7. Drug-Free Workplace Certificate.
8. E-Verify Contractor Affidavit.
9. Statement of Qualifications.
10. Buy America Certification.
11. Proposed Sub-Contractor Information.
12. Certification Regarding Debarment.
13. Prohibition of Segregated Facilities.
14. Certification Regarding Tax Delinquency and Felony Convictions.
15. Certification Regarding Trade Restriction.
16. Certification Regarding Foreign Participation.
17. Certification of Eligibility – Davis Bacon Act.
18. Equal Opportunity Report Statement.
19. Certification Regarding Lobbying.
20. Preliminary Contractor Project Schedule.
21. IRS Form W-9.

The undersigned acknowledges receipt of the following Addendums:

Addendum Number:_____ Date:_____

Addendum Number:_____ Date:_____

Addendum Number:_____ Date:_____

SIGNATURE OF BIDDER:

By _____

Title _____

Name of Company _____

Address of Company _____

City, State, Zip Code _____

Telephone Number _____

SCHEDULE OF PRICES

(See Page B-38 for Alternative Breakdown)

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount

SCHEDULE OF BIDS

TOTAL - BASE BID = $ _____

TOTAL - ADDITIVE ALTERNATIVE 1 = $ _____

TOTAL - ADDITIVE ALTERNATIVE 2 = $ _____

TOTAL: BASE BID + ADDITIVE BIDS $ _____

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
1	C-100-14.01	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	1	L. SUM	$	$
		_____ Dollars _____ Cents				
2	C-102-5.01	TEMPORARY SEEDING AND MULCHING	32	ACRE	$	$
		_____ Dollars _____ Cents				
3	C-102-5.02	INSTALLATION AND REMOVAL OF SILT FENCE	2,100	LIN. FT.	$	$
		_____ Dollars _____ Cents				
4	C-102-5.03	MAINTENANCE OF SILT FENCE	2,100	LIN. FT.	$	$
		_____ Dollars _____ Cents				
5	C-105-6.01	MOBILIZATION	1	L. SUM	$	$
		_____ Dollars _____ Cents				
6	P-101-5.01	FULL DEPTH PAVEMENT MILLING	31,000	SQ. YD.	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
7	P-101-5.02	DRAINAGE STRUCTURE REMOVAL	11	EACH	$	$
		_____ Dollars				
		_____ Cents				
8	P-101-5.03	PIPE REMOVAL	1,700	LIN. FT.	$	$
		_____ Dollars				
		_____ Cents				
9	P-152-4.01	UNCLASSIFIED EXCAVATION	40,700	CU. YD.	$	$
		_____ Dollars				
		_____ Cents				
10	P-152-4.02	ROCK EXCAVATION	2,000	CU. YD.	$	$
		_____ Dollars				
		_____ Cents				
11	P-152-4.03	UNSUITABLE EXCAVATION	3,000	CU. YD.	$	$
		_____ Dollars				
		_____ Cents				
12	P-155-8.01	LIME-TREATED SUBGRADE	5,000	SQ. YD.	$	$
		_____ Dollars				
		_____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
13	P-155-8.02	LIME	80	TON	$	$
		_____ Dollars _____ Cents				
14	P-209-5.01	CRUSHED AGGREGATE BASE COURSE	8,000	CU. YD.	$	$
		_____ Dollars _____ Cents				
15	P-209-5.02	SEPARATION GEOTEXTILE	2,000	SQ. YD.	$	$
		_____ Dollars _____ Cents				
16	P-602-5.01	EMULSIFIED ASPHALT PRIME COAT	6,200	GAL	$	$
		_____ Dollars _____ Cents				
17	P-603-5.01	EMULSIFIED ASPHALT TACK COAT	1,600	GAL	$	$
		_____ Dollars _____ Cents				
18	P-605-5.01	SAWCUT AND SEAL PAVEMENT JOINT	900	LIN. FT.	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
19	P-620-5.01	PAVEMENT MARKING, WHITE, REFLECTIVE, FULL RATE APPLICATION, WITH MICROBICIDE	300	SQ. FT.	$	$
		_____ Dollars _____ Cents				
20	P-620-5.02	PAVEMENT MARKING, YELLOW, NON-REFLECTIVE, HALF RATE APPLICATION	4,500	SQ. FT.	$	$
		_____ Dollars _____ Cents				
21	P-620-5.03	PAVEMENT MARKING, YELLOW, REFLECTIVE, FULL RATE APPLICATION, WITH MICROBICIDE	4,500	SQ. FT.	$	$
		_____ Dollars _____ Cents				
22	P-620-5.04	PAVEMENT MARKING, BLACK, NON-REFLECTIVE, FULL RATE APPLICATION	7,600	SQ. FT.	$	$
		_____ Dollars _____ Cents				
23	P-620-5.05	PAVEMENT MARKING REMOVAL	1,300	SQ. FT.	$	$
		_____ Dollars _____ Cents				
24	D-699-5.01	CONSTRUCTION OF TEMPORARY SEDIMENT POND	1	EACH	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
25	D-699-5.02	MAINTENANCE OF TEMPORARY SEDIMENT POND _____ Dollars _____ Cents	1	EACH	$ _____	$ _____
26	D-699-5.03	CLEANUP & FINAL STABILIZATION OF POND _____ Dollars _____ Cents	1	EACH	$ _____	$ _____
27	D-700-4.01	STONE RETROFITTING _____ Dollars _____ Cents	1	EACH	$ _____	$ _____
28	D-701-5.01	24" RCP STORM DRAIN PIPE, CLASS III _____ Dollars _____ Cents	3,400	LIN. FT.	$ _____	$ _____
29	D-701-5.02	TRENCHING FOR STORM DRAIN PIPE AND BACKFILL IN SOIL _____ Dollars _____ Cents	2,300	LIN. FT.	$ _____	$ _____
30	D-701-5.03	TRENCHING FOR STORM DRAIN PIPE AND BACKFILL IN ROCK _____ Dollars _____ Cents	1,100	LIN. FT.	$ _____	$ _____

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
31	D-751-5.01	CATCH BASINS	18	EACH	$	$
		_____ Dollars _____ Cents				
32	D-751-5.02	CONSTRUCTION OF POND OUTLET STRUCTURE/PIPING	1	EACH	$	$
		_____ Dollars _____ Cents				
33	D-753-5.01	RIP RAP	50	TON	$	$
		_____ Dollars _____ Cents				
34	D-753-5.02	ROCK FILTER DAM	1	EACH	$	$
		_____ Dollars _____ Cents				
35	D-753-5.03	CHECK DAM	20	EACH	$	$
		_____ Dollars _____ Cents				
36	E-891-5.01	INLET PROTECTION	20	EACH	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
37	E-895-5.01	TEMPORARY EROSION CONTROL MATTING	20,000	SQ. YD.	$	$
		_____ Dollars _____ Cents				
38	E-895-5.02	PERMANENT EROSION CONTROL MATTING	20,000	SQ. YD.	$	$
		_____ Dollars _____ Cents				
39	T-901-5.01	SEEDING	32	ACRE	$	$
		_____ Dollars _____ Cents				
40	T-905-5.01	TOPSOIL (OBTAINED ON SITE OR REMOVED FROM STOCKPILE)	14,900	CU. YD.	$	$
		_____ Dollars _____ Cents				
41	T-908-5.01	MULCHING	32	ACRE	$	$
		_____ Dollars _____ Cents				
42	L-108-5.01	REMOVE EXISTING CABLE IN UNIT DUCT, CONDUIT, OR TRENCH	3,800	LIN. FT.	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
43	L-108-5.02	TRENCHING FOR DIRECT BURIED CABLE AND BACKFILL IN SOIL	7,900	LIN. FT.	$	$
		_____ Dollars _____ Cents				
44	L-108-5.03	TRENCHING FOR DIRECT BURIED CABLE AND BACKFILL IN ROCK	2,400	LIN. FT.	$	$
		_____ Dollars _____ Cents				
45	L-108-5.04	NO. 8 AWD 5 KV, L-824, TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK OR CONDUIT	13,700	LIN. FT.	$	$
		_____ Dollars _____ Cents				
46	L-108-5.05	NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE, INSTALLED IN TRENCH, INCLUDING GROUND RODS, CONNECTIONS/TERMINATIONS	7,900	LIN. FT.	$	$
		_____ Dollars _____ Cents				
47	L-108-5.06	2#6 XLP-USE, 1#8 GND INSTALLED IN TRENCH	300	LIN. FT.	$	$
		_____ Dollars _____ Cents				
48	L-108-5.07	NO. 8 AWG, 600V, TYPE THWN CABLE INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	500	LIN. FT.	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
49	L-109-7.01	AIRFIELD VAULT MODIFICATIONS	1	L. SUM	$	$
		_____ Dollars _____ Cents				
50	L-109-7.02	NEW 7.5KW REGULATOR, INSTALLED, COMPLETE (TAXIWAY B)	1	EACH	$	$
		_____ Dollars _____ Cents				
51	L-110-5.01	CONCRETE ENCASED ELECTRICAL DUCT BANK 1-2" SCHEDULE 40 PVC	500	LIN. FT.	$	$
		_____ Dollars _____ Cents				
52	L-110-5.02	CONCRETE ENCASED ELECTRICAL DUCT BANK 2-2" SCHEDULE 40 PVC	400	LIN. FT.	$	$
		_____ Dollars _____ Cents				
53	L-110-5.03	CONCRETE ENCASED ELECTRICAL DUCT BANK 3-2" SCHEDULE 40 PVC	300	LIN. FT.	$	$
		_____ Dollars _____ Cents				
54	L-110-5.04	CONCRETE ENCASED ELECTRICAL DUCT BANK 4-2" SCHEDULE 40 PVC	200	LIN. FT.	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
55	L-110-5.05	NON-ENCASED ELECTRICAL CONDUIT 1-2" SCHEDULE 40 PVC	8,000	LIN. FT.	$	$
		_____ Dollars _____ Cents				
56	L-110-5.06	REMOVE CONDUIT	3,800	LIN. FT.	$	$
		_____ Dollars _____ Cents				
57	L-110-5.07	CLEAR EXISTING CONDUIT	400	LIN. FT.	$	$
		_____ Dollars _____ Cents				
58	L-110-5.08	EXTEND CONCRETE ENCASED ELECTRICAL DUCT BANK 2-2" SCHEDULE 40 PVC	40	LIN. FT.	$	$
		_____ Dollars _____ Cents				
59	L-115-5.01	2-CAN JUNCTION CAN PLAZA, INSTALLED, COMPLETE	2	EACH	$	$
		_____ Dollars _____ Cents				
60	L-115-5.02	SPLICE CAN, INSTALLED, COMPLETE	5	EACH	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
61	L-115-5.03	REMOVE OR RELOCATE EXISTING ELECTRICAL HANDHOLES, INSTALLED, COMPLETE _____ Dollars _____ Cents	2	EACH	$	$
62	L-115-5.04	REMOVE OR RELOCATE EXISTING ELECTRICAL SPLICE CAN, INSTALLED, COMPLETE _____ Dollars _____ Cents	2	EACH	$	$
63	L-115-5.05	EXISTING ELECTRICAL JUNCTION STRUCTURE ELEVATION ADJUSTMENT _____ Dollars _____ Cents	4	EACH	$	$
64	L-115-5.06	3-CAN JUNCTION CAN PLAZA, INSTALLED, COMPLETE _____ Dollars _____ Cents	2	EACH	$	$
65	L-125-5.01	L-861T(L) TAXIWAY STAKE MOUNTED EDGE LIGHT, INSTALLED, COMPLETE _____ Dollars _____ Cents	77	EACH	$	$
66	L-125-5.02	L-861T(L) TAXIWAY BASE MOUNTED EDGE LIGHT, INSTALLED, COMPLETE _____ Dollars _____ Cents	45	EACH	$	$

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
67	L-125-5.03	RELOCATE GUIDANCE SIGN, 1 MODULE ON NEW FOUNDATION, INSTALLED, COMPLETE	1	EACH	$	$
		_____ Dollars _____ Cents				
68	L-125-5.04	RELOCATE GUIDANCE SIGN, 2 MODULE ON NEW FOUNDATION, INSTALLED, COMPLETE	1	EACH	$	$
		_____ Dollars _____ Cents				
69	L-125-5.05	RELOCATE GUIDANCE SIGN, 3 MODULE ON NEW FOUNDATION, INSTALLED, COMPLETE	4	EACH	$	$
		_____ Dollars _____ Cents				
70	L-125-5.06	NEW GUIDANCE SIGN, 3 MODULE ON NEW FOUNDATION, INSTALLED, COMPLETE	2	EACH	$	$
		_____ Dollars _____ Cents				
71	L-125-5.07	L-853 TYPE II RETROREFLECTIVE MARKERS, INSTALLED, COMPLETE	18	EACH	$	$
		_____ Dollars _____ Cents				
72	L-125-5.08	REMOVE AND REINSTALL L-850C, HIGH INTENSITY RUNWAY EDGE LIGHT, IN-PAVEMENT, INSTALLED, COMPLETE	1	EACH	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
73	L-125-5.09	REMOVE ELEVATED LIGHT	46	EACH	$	$
		_____ Dollars _____ Cents				
74	L-125-5.10	REMOVE GUIDANCE SIGN FOUNDATION	7	EACH	$	$
		_____ Dollars _____ Cents				
75	L-125-5.11	REMOVE AND REPLACE GUIDANCE SIGN ISOLATION TRANSFORMER	7	EACH	$	$
		_____ Dollars _____ Cents				
76	L-125-5.12	UPGRADE STAKE MOUNTED L-861T(L) EDGE LIGHTS TO BASE MOUNTED	77	EACH	$	$
		_____ Dollars _____ Cents				
77	GDOT 167-5.01	WATER QUALITY INSPECTIONS	7	MONTH	$	$
		_____ Dollars _____ Cents				
78	GDOT 167-5.02	WATER QUALITY MONITORING AND SAMPLING	7	EACH	$	$
		_____ Dollars _____ Cents				

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
BASE BID						
79	GDOT-402-5.01	RECYLCLED ASPHALTIC CONCRETE 12.5MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	2,400	TON	$	$
		Dollars Cents				
80	GDOT-402-5.02	RECYLCLED ASPHALTIC CONCRETE 19MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	3,300	TON	$	$
		Dollars Cents				
		TOTAL - BASE BID =			$	

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
ADDITIVE ALTERNATIVE 1						
1	P-209-5.01	CRUSHED AGGREGATE BASE COURSE _____ Dollars _____ Cents	500	CU. YD.	$	$
2	P-602-5.01	EMULSIFIED ASPHALT PRIME COAT _____ Dollars _____ Cents	800	GAL	$	$
3	P-603-5.01	EMULSIFIED ASPHALT TACK COAT _____ Dollars _____ Cents	200	GAL	$	$
4	P-620-5.02	PAVEMENT MARKING, YELLOW, NON-REFLECTIVE, HALF RATE APPLICATION _____ Dollars _____ Cents	500	SQ. FT.	$	$
5	P-620-5.03	PAVEMENT MARKING, YELLOW, REFLECTIVE, FULL RATE APPLICATION, WITH MICROBICIDE _____ Dollars _____ Cents	500	SQ. FT.	$	$
6	P-620-5.04	PAVEMENT MARKING, BLACK, NON-REFLECTIVE, FULL RATE APPLICATION _____ Dollars _____ Cents	1,000	SQ. FT.	$	$

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
ADDITIVE ALTERNATIVE 1						
7	L-125-5.07	L-853 TYPE II RETROREFLECTIVE MARKERS, INSTALLED, COMPLETE	18	EACH	$	$
		_____ Dollars _____ Cents				
8	GDOT-402-5.01	RECYLCLED ASPHALTIC CONCRETE 12.5MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	300	TON	$	$
		_____ Dollars _____ Cents				
9	GDOT-402-5.02	RECYLCLED ASPHALTIC CONCRETE 19MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	300	TON	$	$
		_____ Dollars _____ Cents				
		TOTAL - ADDITIVE ALTERNATIVE 1 =			$	

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
ADDITIVE ALTERNATIVE 2						
1	P-209-5.01	CRUSHED AGGREGATE BASE COURSE _____ Dollars _____ Cents	400	CU. YD.	$	$
2	P-602-5.01	EMULSIFIED ASPHALT PRIME COAT _____ Dollars _____ Cents	400	GAL	$	$
3	P-603-5.01	EMULSIFIED ASPHALT TACK COAT _____ Dollars _____ Cents	100	GAL	$	$
4	P-620-5.02	PAVEMENT MARKING, YELLOW, NON-REFLECTIVE, HALF RATE APPLICATION _____ Dollars _____ Cents	200	SQ. FT.	$	$
5	P-620-5.03	PAVEMENT MARKING, YELLOW, REFLECTIVE, FULL RATE APPLICATION, WITH MICROBICIDE _____ Dollars _____ Cents	200	SQ. FT.	$	$
6	P-620-5.04	PAVEMENT MARKING, BLACK, NON-REFLECTIVE, FULL RATE APPLICATION _____ Dollars _____ Cents	300	SQ. FT.	$	$

SCHEDULE OF BIDS

RICHARD B. RUSSELL REGIONAL AIRPORT
TAXIWAY BRAVO WEST RELOCATION
FLOYD COUNTY BID NO. 26-022

GDOT PROJECT NUMBER: XXXX-XXXX-XXXX

Item No.	Spec. No.	Item Description / (Write Unit Price in Words)	Estimated Quantity	Unit	Unit Price	Amount
ADDITIVE ALTERNATIVE 2						
7	L-125-5.07	L-853 TYPE II RETROREFLECTIVE MARKERS, INSTALLED, COMPLETE	6	EACH	$	$
		_____ Dollars _____ Cents				
8	GDOT-402-5.01	RECYLCLED ASPHALTIC CONCRETE 12.5MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	200	TON	$	$
		_____ Dollars _____ Cents				
9	GDOT-402-5.02	RECYLCLED ASPHALTIC CONCRETE 19MM SUPERPAVE, GROUP-BLEND, INCLUDING POLYMER-MODIFIED BITUMINOUS MATERIALS AND HYDRATED LIME	200	TON	$	$
		_____ Dollars _____ Cents				
		TOTAL - ADDITIVE ALTERNATIVE 2 =			$	

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ as

Principal, and _____as

Surety, are hereby held and firmly bound unto **Floyd County Board of Commissioners** (OWNER) in the penalty

sum of _____($_____) for the payment of which, well and truly

to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and

assigns.

Signed, this _____ day of _____,20____.

The condition of the above obligation is such that whereas the Principal has submitted to **Floyd County Board of Commissioners** certain BID, attached hereto and hereby made a part hereof to enter into a Contract in writing for **Taxiway Bravo West Relocation.**

NOW THEREFORE,

(a) If said Bid shall be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall execute and deliver a Contract in the Form of Agreement attached hereto (properly completed in accordance with said Bid) and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that obligations of said Surety and its Bonds shall be in no way impaired or affected by any extension of the time within which the Owner may accept such BID; and said Surety does hereby waive notice of any such extension.

(The remainder of this page is intentionally left blank)

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.)
Principal

_____
Surety

By:_____

(SEAL)

(1) Date of Bond must be same date as Bid.

(2) Bond must be signed or countersigned by Surety's proper Georgia Resident Agent. Date of Power-of-Attorney shall be same date as date of Bond.

(3) If a Partnership, all partners shall execute Bond.

BIDDERS DECLARATION

The bidder understands, agrees and warrants:

- That the bidder has carefully read and fully understands the full scope of the specifications.
- That the bidder has the capability to successfully undertake and complete the responsibilities and obligations in said specifications.
- That this bid may be withdrawn by requesting such withdrawal in writing at any time prior to **2:00 PM on Tuesday, June 30, 2026,** but may not be withdrawn after such date and time.
- That Floyd County reserves the right to waive compliance by any applicant with any provision contained in this request whenever the County in its sole discretion believes such waiver is in the County's best interests
- That by submission of this quote the bidder acknowledges that Floyd County has the right to make any inquiry or investigation it deems appropriate to substantiate or supplement information supplied by the bidder.
- That the accompanying bid is not the result of or affected by, any act of collusion with another person or company engaged in the same line of business or commerce, or any other fraudulent act punishable under Georgia or United States law.

BIDDER:

Company Name: _____

Phone: _____

Name Print: _____

Signature: _____

Email: _____

Date: _____

CERTIFICATE OF NON-COLLUSION

By responding to this solicitation, the supplier understands and agrees to the following:

1. That the submitted response constitutes an offer, which when accepted in writing by Floyd County, and subject to the terms and conditions of such acceptance, will constitute a valid and binding contract between the undersigned and Floyd County; and

2. That the suppler has read the specifications and requirements shown or referenced in the solicitation and that the supplier's response is made in accordance with the provisions of such specifications and requirements except as expressly stated otherwise in the supplier's response; and

3. That the supplier guarantees and certifies that all items included in the supplier's response meet or exceed any and all such stated specifications and requirements of the solicitation except as expressly stated otherwise in the supplier's response; and

4. That, if awarded a contract, the supplier will deliver goods and or services that meet or exceed the specifications and requirements of the solicitation except as expressly stated otherwise in the supplier's response, and

5. That the response submitted by the supplier shall be valid and held open for a period of one hundred and twenty (120) days (or such other time period as identified in the solicitation) from the final solicitation closing date and that the response may be held open for an additional period of time subject to the supplier's consent; and

6. That the supplier's response is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a response for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. The supplier understands and agrees that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards; and

7. That the provisions of the Official Code of Georgia Annotated, Sections 36-91 have not been violated and will not be violated in any respect.

CERTIFICATE OF NON-COLLUSION [cont'd.]

DO NOT MODIFY THE BID/PROPOSAL CERTIFICATION TERMS IN ANY WAY. THIS FORM MUST BE COMPLETED, SIGNED AND SUBMITTED WITH YOUR RESPONSE.

Contractor's Full Legal Name: (PLEASE TYPE OR PRINT)	
Authorized Signature:	
Printed Name and Title of Person Signing:	
Date:	
Company Address:	
FAX Number:	
Email Address:	
*This table must be completed in its entirety by the supplier.	

Revised 08/22/2017 FLOYD 2017

CERTIFICATE OF NON-DISCRIMINATION

In connection with the performance of work under this contract, the bidder agrees as follows:

The bidder agrees not to discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, ancestry or disability. The vendor shall take affirmative action to ensure that employees are treated without regard to their race, creed, color, sex, national origin, ancestry, or disability. Such action shall include, but not be limited to the following: employment, upgrading, demotion, transfer, recruiting, or recruitment, advertising, lay-off or termination, rates of pay or other compensation and selection for training, including apprenticeship.

In the event of the bidder's non-compliance with this non-discrimination clause, the contract may be canceled or terminated by Floyd County Board of Commissioners. The bidder may be declared, by Floyd County, ineligible for further contracts with Floyd County until satisfactory proof of intent to comply shall be made by the vendor.

The bidder agrees to include this non-discrimination clause in any sub-contracts connected with the performance of this agreement.

BIDDER _____

SIGNATURE _____

TITLE _____

ATTACHMENT

FLOYD COUNTY BOARD OF COMMISSIONERS
DRUG-FREE WORKPLACE CERTIFICATE

By signature on this certificate, the Vendor certifies that the provisions of O.C.G.A. Section 50-24-1 through 50-24-6 related to the "Drug-Free Workplace Act" have been complied with in full. The Vendor further certifies that:

1. A drug-free workplace will be provided for the Vendor's employees during the performance of the contract; and

2. Each Vendor who hires a sub-Vendor to work in a drug-free workplace shall secure from that sub-Vendor the following written certification: "As part of the subcontracting agreement with (Vendor's name), (sub-Vendor's name) certifies to the Vendor that a drug-free workplace will be provided for the sub-Vendor's employees during the performance of this contract pursuant to O.C.G.A. Section 50-24-3(b)(7)."

By signature on this certificate, the Vendor further certifies that it will not engage in the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of this contract.

Vendor: _____

By: _____

Name Printed: _____

Title: _____

Date: _____

CONTRACTOR AFFIDAVIT UNDER O.C.G.A. § 13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of Floyd County Georgia has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_____ _____
Federal Work Authorization User Identification Number Date of Authorization

_____ _____
Name of Contractor

_____
Address of Contractor

Taxiway Bravo West Relocation
Name of Project

FLOYD COUNTY, GEORGIA
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____ in 202__ in _____(city), _____(state).

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 202___.

_____
NOTARY PUBLIC

My Commission Expires:_____
(Notary Seal or Stamp Required)

COMPLETE FOR BID

STATEMENT OF QUALIFICATIONS
(Bidders Must Be Pre-Qualified with the Georgia Department of Transportation)

SIMILAR PROJECTS COMPLETED

DATE_____ VALUE_____

Name of Project, Address, Type of Improvement.

_____

_____

_____

SIMILAR PROJECTS UNDER CONTRACT

DATE_____ VALUE_____

Name of Project, Address, Type of Improvement.

_____

_____

_____

PROPOSED EQUIPMENT TO BE USED ON PROJECT

_____

_____

_____

FINANCIAL STATEMENT: Attached is a copy of my latest financial statement listing assets and liabilities. In lieu of the financial statement, a bidder may submit evidence that he is pre-qualified with the Georgia Department of Transportation and is on the "Current Bidders List" for projects of this size and nature.

Bidder_____

By_____

Address_____

COMPLETE FOR BID

BUY AMERICA CERTIFICATION FORM FOR MANUFACTURED PRODUCTS

(Non-building projects such as airfield/roadway construction, equipment acquisition, etc.)

(Title 49 U.S.C. Section 50101)

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

☐ The Bidder or Offeror 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 product.
3. To furnish US domestic product for any waiver request that the FAA rejects.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

☐ The Bidder or Offeror 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 or Offeror 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 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 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 the item components and subcomponents produced in the United States is more that 60% of the cost of all components and subcomponents of the "item". The required documentation for a type 3 waiver is:

a) Listing of all product components and subcomponents 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).

b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
c) Percentage of non-domestic component and subcomponent cost as compared to total "item" component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

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

COMPLETE FOR BID

PROPOSED SUBCONTRACTOR INFORMATION
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

Provide the name, business address, and portion of work (description of work to be done) for each subcontractor that will be used in the work if the Bidder is awarded the Contract. This document shall include all subcontractors who propose to do **in excess of five percent (5%)** of the total amount of the bid. No subcontractor doing work **in excess of five percent (5%)** of the total amount of the bid and who is not listed shall be used without the written approval of the Owner.

A. Type of Work:_____

Dollar Value of Work:_____

Name:_____

Address:_____
Street City

B. Type of Work:_____

Dollar Value of Work:_____

Name:_____

Address:_____
Street City

C. Type of Work:_____

Dollar Value of Work:_____

Name:_____

Address:_____
Street City

D. Type of Work:_____

Dollar Value of Work:_____

Name:_____

Address:_____
Street City

E. Type of Work: _____

Dollar Value of Work: _____

Name: _____

Address: _____
Street City

F. Type of Work: _____

Dollar Value of Work: _____

Name: _____

Address: _____
Street City

G. Type of Work: _____

Dollar Value of Work: _____

Name: _____

Address: _____
Street City

SIGNATURE OF BIDDER _____
Individual or Corporate Name

By _____
(Signature of Authorized Individual)

_____
(Name of Authorized Individual)

Address _____

_____

COMPLETE FOR BID

CERTIFICATION OF OFFERER / BIDDER REGARDING DEBARMENT
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

CERTIFICATION OF OFFERER/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: http://www.sam.gov.

2. Collecting a certification statement similar to the Certification of Offeror /Bidder Regarding Debarment, above.

3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the Federal Aviation Administration 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.

_____ _____
Bidder's Firm Name Date

_____
Signature

COMPLETE FOR BID

PROHIBITION OF SEGREGATED FACILITIES
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

(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 Employment 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 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 rest rooms 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 Employment Opportunity clause of this contract.

_____ _____
Bidder's Firm Name Date

_____
Signature

COMPLETE FOR BID

CERTIFICATION OF OFFERER / BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

1) The applicant represents that it is (__) is not (__) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2) The applicant represents that it is (__) is not (__) is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

_____ _____

Bidder's Firm Name Date

_____

Signature

COMPLETE FOR BID

CERTIFICATION REGARDING TRADE RESTRICTION
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

1) 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 (USTR);

2) 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 USTR; and

3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

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 USC 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 USTR or

2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or

3) who incorporates in the public works project any product of a foreign country on such USTR list.

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 USTR, 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 (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

_____ _____

Bidder's Firm Name Date

_____

Signature

COMPLETE FOR BID

CERTIFICATION REGARDING FOREIGN PARTICIPATION
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

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;

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 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.

Signature of Contractor

Title

COMPLETE FOR BID

CERTIFICATION OF ELIGIBILITY – DAVIS BACON ACT
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

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).

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).

The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 USC 1001.

Signature of Contractor	Title

COMPLETE FOR BID

EQUAL OPPORTUNITY REPORT STATEMENT AS REQUIRED BY 41 CFR 60-1.7(b)
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

The Bidder (Proposer) shall complete the following statement by checking the appropriate blanks. Failure to complete these blanks may be grounds for rejection of bid. Reference page FCP-24 for further information.

1. The Bidder (Proposer) has _____ has not _____ developed and has on file at each establishment affirmative action programs pursuant to 41 CFR 60-1.40 and 41 CFR 60-2.

2. The Bidder (Proposer) has _____ has not _____ participated in any previous contract or subcontract subject to the equal opportunity clause prescribed by Executive Order 11246, as amended.

3. The Bidder (Proposer) has _____ has not _____ filed with the Joint Reporting Committee the annual compliance report on Standard Form 100 (EEO-1 Report).

4. The Bidder (Proposer) does _____ does not _____ employ fifty (50) or more employees.

NAME OF BIDDER: _____

BY: _____

TITLE: _____

DATE: _____

COMPLETE FOR BID

CERTIFICATION REGARDING LOBBYING
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

The Bidder or Offeror certifies by signing and submitting this bid or proposal, 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 or Offeror, 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 undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

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.

_____ _____
Bidder's Firm Name Date

_____
Signature

COMPLETE FOR BID

PRELIMINARY CONTRACTOR PROJECT SCHEDULE
(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

All bidders are required to complete and submit with their bids the following Preliminary Contractor Project Schedule. This schedule will be used strictly as an anticipatory pre-construction scheduling and estimating tool. This preliminary schedule is non-binding and in no instance will negate the contract time specified in the bid and contract documents. Failure to complete this form or the blatant misrepresentation of information may be grounds for rejection of bid.

Estimated number of work hours per weekday: _____ hours

Estimated number of work hours per weekend: _____ hours

BASE BID - ANTICIPATED WORKDAYS / HOURS

WORK ITEM	WEEKDAYS	HRS	WEEKEND	HRS	TOTAL DAYS
Mobilization & Erosion Control	days		days		days
Bituminous Pavement Removal	days		days		days
Grading & Drainage Improvements	days		days		days
Grading & Drainage Removals	days		days		days
Bituminous Pavement Construction	days		days		days
Pavement Marking	days		days		days
Lighting Improvements	days		days		days
Grassing, Mulching & Site Restoration	days		days		days
	days		days		days
	days		days		days
				SUM OF DAYS=_____	**days**

ALTERNATIVE 1 - ANTICIPATED WORKDAYS / HOURS					
WORK ITEM	**WEEKDAYS**	**HRS**	**WEEKEND**	**HRS**	**TOTAL DAYS**
Mobilization & Erosion Control	days		days		days
Bituminous Pavement Removal	days		days		days
Grading & Drainage Improvements	days		days		days
Grading & Drainage Removals	days		days		days
Bituminous Pavement Construction	days		days		days
Pavement Marking	days		days		days
Lighting Improvements	days		days		days
Grassing, Mulching & Site Restoration	days		days		days
	days		days		days
	days		days		days
				SUM OF DAYS=_____days	

ALTERNATIVE 2 - ANTICIPATED WORKDAYS / HOURS					
WORK ITEM	**WEEKDAYS**	**HRS**	**WEEKEND**	**HRS**	**TOTAL DAYS**
Mobilization & Erosion Control	days		days		days
Bituminous Pavement Removal	days		days		days
Grading & Drainage Improvements	days		days		days
Grading & Drainage Removals	days		days		days
Bituminous Pavement Construction	days		days		days
Pavement Marking	days		days		days
Lighting Improvements	days		days		days
Grassing, Mulching & Site Restoration	days		days		days
	days		days		days
	days		days		days
				SUM OF DAYS=_____days	

COMPLETE FOR BID

IRS FORM W-9

(BIDDER SHALL SUBMIT THIS FORM AT THE TIME OF BID SUBMITTAL)

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type See Specific Instructions on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:
☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate
☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____
Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.
☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) _____
Exemption from FATCA reporting code (if any) _____
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number
☐☐☐ - ☐☐ - ☐☐☐☐

or

Employer identification number
☐☐ - ☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here **Signature of U.S. person ▶** **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

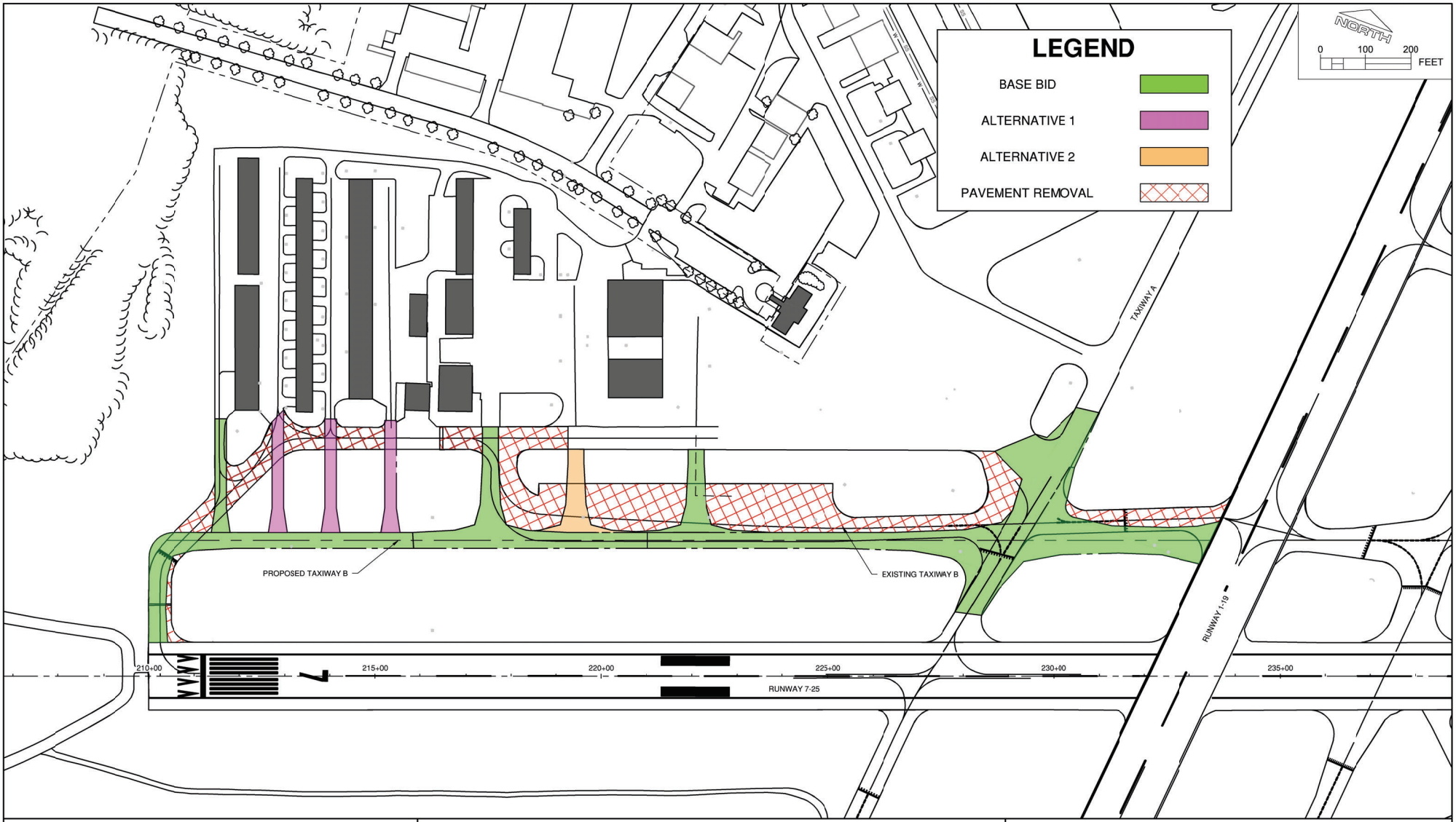
Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Cat. No. 10231X Form **W-9** (Rev. 12-2014)



RMG
Richard B. Russell Regional Airport
ROME, GEORGIA

RICHARD B. RUSSELL
REGIONAL AIRPORT

ROME, GEORGIA

TAXIWAY BRAVO WEST RELOCATION

PROPOSED ALTERNATIVES

JUNE 2026

CMT
CRAWFORD, MURPHY & TILLY, INC.
ENGINEERS AND CONSULTANTS

DIVISION 3 – CONTRACT FORMS

(This Page Intentionally Left Blank.)

CONTRACT AGREEMENT

FLOYD COUNTY BOARD OF COMMISSIONERS
RICHARD B. RUSSELL REGIONAL AIRPORT

THIS AGREEMENT, MADE AS OF *{INSERT EFFECTIVE DATE OF AGREEMENT}* IS

BY AND BETWEEN

the OWNER: Floyd County Board of Commissioners
12 East 4th Avenue
Rome, Georgia 30161

And the CONTRACTOR: *{Insert Contractor's Name, Address, City/State/Zip Code}*

WITNESSETH:

WHEREAS it is the intent of the Owner to make improvements at **Richard B. Russell Regional Airport** generally described as follows;

Taxiway Bravo West Relocation

hereinafter referred to as the Project.

NOW THEREFORE in consideration of the mutual covenants hereinafter set forth, OWNER and CONTRACTOR agree as follows:

Article 1 – Work

It is hereby mutually agreed that for and in consideration of the payments as provided for herein to the CONTRACTOR by the OWNER, CONTRACTOR shall faithfully furnish all necessary labor, equipment, and material and shall fully perform all necessary work to complete the Project in strict accordance with this Contract Agreement and the Contract Documents.

Article 2 – Contract Documents

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

2.1 This Agreement (pages ___ to ___, inclusive).

2.2 Schedule of Unit Prices (pages ____ to ____, inclusive).

2.3 Performance and Payment Bonds, identified as **Exhibit "B" and Exhibit "C"**, and consisting of _____ pages.

2.4 Federal Contract, General Contract Provisions, Supplementary Conditions.

2.5 General Requirements.

2.6 Technical Specifications as listed in table of contents of the Project Manual.

2.7 Drawings, consisting of a cover sheet and sheets numbered ___ through ___ inclusive with each sheet bearing the following general title:

Richard B. Russell Regional Airport
Taxiway Bravo West Relocation

2.8 Addenda numbers __ to __ inclusive.

2.9 CONTRACTOR'S Bid (pages ___to ____, inclusive), consisting of ___ pages, and marked as **Exhibit "A".**

2.10. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to the General Provisions.

There are no Contract Documents other than those listed in this Article 2. The Contract Documents may only be amended, modified, or supplemented as provided in the General Provisions. All documents comprising the Contract Documents are complementary to one another and together establish the complete terms, conditions and obligations of the CONTRACTOR. All said Contract Documents are incorporated by reference into the Contract Agreement as if fully rewritten herein or attached thereto.

Article 3 – Contract Price

In consideration of the faithful performance and completion of the Work by the CONTRACTOR in accordance with the Contract Documents, OWNER shall pay the CONTRACTOR an amount equal to:

$_____
(Amount in Numerals)

subject to the following:

a. Said amount is based on the schedule of prices and estimated quantities stated in CONTRACTOR'S Bid Proposal, which is attached to and made a part of this Agreement;

b. Said amount is the aggregate sum of the result of the CONTRACTOR'S stated unit prices multiplied by the associated estimated quantities;

c. CONTRACTOR and OWNER agree that said estimated quantities are not guaranteed and that the determination of actual quantities is to be made by the OWNER'S ENGINEER;

d. Said amount is subject to modification for additions and deductions as provided for within the Contract General Provisions.

Article 4 – Payment

Upon the completion of the work and its acceptance by the OWNER, all sums due the CONTRACTOR by reason of faithful performance of the work, taking into consideration additions to or deductions from the Contract price by reason of alterations or modifications of the original Contract or by reason of "Extra Work" authorized under this Contract, will be paid to the CONTRACTOR by the OWNER after said completion and acceptance.

The acceptance of final payment by the CONTRACTOR shall be considered as a release in full of all claims against the OWNER, arising out of, or by reason of, the work completed and materials furnished under this Contract.

OWNER shall make progress payments to the CONTRACTOR in accordance with the terms set forth in the General Provisions. Progress payments shall be based on estimates prepared by the ENGINEER for the value of work performed and materials completed in place in accordance with the Contract Drawings and Specifications.

Progress payments are subject to retainage requirements as set forth in the Contract Documents.

Article 5 – Contract Time

The CONTRACTOR agrees to commence work within fourteen (14) calendar days of the date specified in the OWNER'S Notice-to-Proceed. CONTRACTOR further agrees to complete said work **within 240 Consecutive Calendar Days** of the commencement date stated within the Notice-to-Proceed.

It is expressly understood and agreed that the stated Contract Time is reasonable for the completion of the Work, taking all factors into consideration. Furthermore, extensions of the Contract Time may only be permitted by execution of a formal modification to this Contract Agreement in accordance with the General Provisions and as approved by the OWNER.

Article 6 – Liquidated Damages

The CONTRACTOR and OWNER understand and agree that time is of essence for completion of the Work and that the OWNER will suffer additional expense and financial loss if said Work is not completed within the authorized Contract Time. Furthermore, the CONTRACTOR and OWNER recognize and understand the difficulty, delay, and expense in establishing the exact amount of actual financial loss and additional expense. Accordingly, in place of requiring such proof, the CONTRACTOR expressly agrees to pay the OWNER as liquidated damages the non-penal sum of **$1,500.00 per day** for each calendar day required in excess of the authorized Contract Time.

Furthermore, the CONTRACTOR understands and agrees that;

a. the OWNER has the right to deduct from any moneys due the CONTRACTOR, the amount of said liquidated damages;

b. the OWNER has the right to recover the amount of said liquidated damages from the CONTRACTOR, SURETY or both.

c. in addition to liquidated damages specified above, to pay the OWNER the actual costs to OWNER for any inspector or inspectors necessarily employed by OWNER on the Work and the actual costs to OWNER for the ENGINEER's observation of construction and project representative services including all travel and subsistence expenses after the date specified for completion until the Work is completed and ready for final payment.

Article 7 – CONTRACTOR'S Representations

The CONTRACTOR understands and agrees that all representations made by the CONTRACTOR within the Proposal shall apply under this Agreement as if fully rewritten herein.

Article 8 – Miscellaneous

a. CONTRACTOR understands that it shall be solely responsible for the means, methods, techniques, sequences and procedures of construction in connection with completion of the Work;

b. CONTRACTOR understands and agrees that it shall not accomplish any work or furnish any materials that are not covered or authorized by the Contract Documents unless authorized in writing by the OWNER or ENGINEER;

c. The rights of each party under this Agreement shall not be assigned or transferred to any other person, entity, firm or corporation without prior written consent of both parties;

d. OWNER and CONTRACTOR each bind itself, their partners, successors, assigns and legal representatives to the other party in respect to all covenants, agreements, and obligations contained in the Contract Documents.

Article 9 – OWNER'S Representative

The OWNER'S Representative, herein referred to as ENGINEER, is defined as follows:

Crawford, Murphy & Tilly, Inc.
3330 Cumberland Boulevard SE
Suite 125
Atlanta, Georgia 30339

Said ENGINEER will act as the OWNER'S representative and shall assume all rights and authority assigned to the ENGINEER as stated within the Contract Documents in connection with the completion of the Project Work.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have executed four (4) copies of this Agreement on the day and year first noted herein.

OWNER

Name: _____

Address: _____

_____

_____

By: _____
Signature

_____
Title of Representative

ATTEST

By: _____
Signature

_____
Title

CONTRACTOR

Name: _____

Address: _____

_____

_____

By: _____
Signature

_____
Title of Representative

ATTEST

By: _____
Signature

_____
Title

CERTIFICATE OF SECRETARY OF

_____

AS TO RESOLUTION ADOPTED BY BOARD OF DIRECTORS

ON _____
(date)

I, _____, hereby certify that I am the duly authorized Secretary of _____, charged with keeping the records and the seal of said Corporation, and that the following is a true and correct copy of a resolution adopted at a meeting of the Board of Directors of the Corporation duly held on _____, which resolution is now in full force and effect.

RESOLVED, that _____, (President, Vice President) of _____, is hereby authorized to execute contracts, performance bonds and labor and materials bonds on behalf of the Corporation.

WITNESS my hand as Secretary, and the seal of the Corporation this ____ day of _____, 20____.

_____
Secretary

Sworn to before me this __

day of _____, 20____.

_____

Notary Public for _____County

My Commission Expires: _____

PERFORMANCE BOND

Bond Number

PRINCIPAL *(Legal Name and Business Address)*	STATE OF INCORPORATION

SURETY *(Legal Name and Business Address)*	CONTRACT NO.	CONTRACT DATE

PENAL SUM OF BOND *(Expressed in words and numerals)*

OBLIGATION

KNOW ALL PERSONS BY THESE PRESENTS, that the above-named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above-named SURETY hereby bind themselves unto **Floyd County Board of Commissioners**, as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into the written contract agreement identified hereinabove with the OWNER for the following project:

Project Name: **Taxiway Bravo West Relocation**

Project Location: **Richard B. Russell Regional Airport; Floyd County, Georgia**

which said contract and associated contract documents, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

CONDITION

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform all undertakings, covenants, terms, conditions and agreements of the Contract during the original term of the Contract and any extensions thereof that are granted by the OWNER, with or without notice to the SURETY, and during the period of any guarantee or warranties required under the Contract, and if CONTRACTOR shall perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of the Contract that hereafter are made, then this obligation shall be void; otherwise it shall remain in full force and effect subject to the following additional conditions:

1. SURETY, for value received, hereby stipulates and agrees that no change, extension of time, modification, omission, addition or change in or to the Contract, or the work performed thereunder or the specifications accompanying the same, shall in any way affect the SURETY'S obligation on this bond; and SURETY hereby agrees to waive notice of any and all such extensions, modifications, omissions, alterations, and additions to the terms of the Contract, work or specifications.
2. Whenever CONTRACTOR shall be and declared by the OWNER to be in default under the Contract, the Surety shall promptly and at the SURETY'S expense remedy the default by implementing one or more of the following actions:
    a. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or
    b. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

c. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract; arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER'S concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract; and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the penal sum of the bond. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by OWNER to CONTRACTOR under the Contract and any amendments thereto, disbursed at the rate provided in the original contract, less the amount properly paid by OWNER to CONTRACTOR.

d. With written consent of the OWNER, SURETY may waive its right to perform and complete, arrange for completion or obtain a new contractor and with reasonable promptness, investigate and determine the amount the SURETY is liable to the OWNER and tender payment therefor to the OWNER.

3. CONTRACTOR and SURETY agree that if in connection with the enforcement of this Bond, the OWNER is required to engage the services of an attorney, that reasonable attorney fees incurred by the OWNER, with or without suit, are in addition to the balance of the contract price.

4. No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the successors or assigns of the OWNER.

WITNESS

In witness whereof, this instrument is executed this the _____ day of _____, 20___.

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST**:**

Corporate Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Corporate Seal)

SURETY:

ATTEST**:**

Surety Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Seal) (Attach Power of Attorney)

PAYMENT BOND

Bond Number

PRINCIPAL *(Legal Name and Business Address)*	STATE OF INCORPORATION

SURETY *(Legal Name and Business Address)*	CONTRACT NO.	CONTRACT DATE

PENAL SUM OF BOND *(Expressed in words and numerals)*

OBLIGATION
KNOW ALL PERSONS BY THESE PRESENTS, that the above-named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above-named SURETY hereby bind themselves unto **Floyd County Board of Commissioners**, as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,
CONTRACTOR has entered into the written contract agreement identified hereinabove with the OWNER for the following project:

Project Name: **Taxiway Bravo West Relocation**

Project Location: **Richard B. Russell Regional Airport; Floyd County, Georgia**

which said contract and associated contract documents, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

CONDITION
NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly make payment to all employees, persons, firms or corporations for all incurred indebtedness and just claims for labor, supplies, materials and services furnished for or used in connection with the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect subject to the following additional conditions:

1. CONTRACTOR and SURETY indemnify and hold harmless the OWNER for all claims, demands, liens or suits that arise from performance of the Contract
2. SURETY, for value received, hereby stipulates and agrees that no change, extension of time, modification, omission, addition or change in or to the Contract, or the work performed thereunder or the specifications accompanying the same, shall in any way affect the SURETY'S obligation on this bond; and SURETY hereby agrees to waive notice of any and all such extensions, modifications, omissions, alterations, and additions to the terms of the Contract, work or specifications.
3. No final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

4. The amount of this bond shall be reduced by and to the extent of any payments made in good faith hereunder.
5. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy obligations of the CONTRACTOR and the SURETY under this Bond, subject to the OWNER'S priority to use the funds for the completion of the project.

WITNESS

In witness whereof, this instrument is executed this the _____ day of _____, 20___.

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST**:**

Corporate Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Corporate Seal)

SURETY:

ATTEST**:**

Surety Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Seal) (Attach Power of Attorney)

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal representative of the **Floyd County Board of Commissioners,** do hereby certify as follows:

I have examined the foregoing Contract Agreement(s) and Surety Bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the **Floyd County Board of Commissioners,** thereto acting through its duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the **Floyd County Board of Commissioners;** and that the foregoing agreements constitute valid and legally binding obligations upon the **Floyd County Board of Commissioners,** in accordance with terms, conditions and provisions thereof.

Dated at _____, this _____ day of _____, 20__.

Signature: _____

Title: _____

DIVISION 4 – CONTRACT PROVISIONS

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PART A
FEDERAL CONTRACT PROVISIONS

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FEDERAL CONTRACT PROVISIONS

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A27 Veteran’s Preference

A1 ACCESS TO RECORDS AND REPORTS

Reference: 2 CFR § 200.333; 2 CFR § 200.336; FAA Order 5100.38

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, 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.

A2 AFFIRMATIVE ACTION REQUIREMENT

Reference: 41 CFR part 60-4; Executive Order 11246

Female Participation. Executive Order 11246 has set a goal of 6.9% nationally for female participation for all construction projects. This value remains constant for all counties and states.

Refer to Division 1, Notice to Bidders / Invitation for Bid.

A3 BREACH OF CONTRACT TERMS

Reference: 2 CFR § 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 the 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.

A4 BUY AMERICAN PREFERENCE

Reference: Title 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 Federal Aviation Administration 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 or offeror must complete and submit the Buy America certification included herein with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

A5 CIVIL RIGHTS - GENERAL

Reference: 49 USC § 47123

The Contractor agrees to 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 disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

A6 CIVIL RIGHTS – TITLE VI ASSURANCE

Reference: 49 USC § 47123; FAA Order 1400.11

Title VI Solicitation Notice:

The Floyd County Board of Commissioners, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that any contract entered into pursuant to this advertisement, [select disadvantaged business enterprises or airport concession 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.

Compliance with Nondiscrimination Requirements:

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 Acts 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. **Nondiscrimination:** 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 Nondiscrimination Acts and Authorities, 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 Nondiscrimination Acts and Authorities 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 Nondiscrimination Acts and Authorities 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 or 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 the 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 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.

Title VI List of Pertinent Nondiscrimination Acts and Authorities

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 USC § 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 USC § 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 USC § 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 USC § 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 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration's Nondiscrimination statute (49 USC § 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 nondiscrimination 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 USC 1681 et seq).

A7 CLEAN AIR AND WATER POLLUTION CONTROL

Reference: 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 USC § 740-7671q) and the Federal Water Pollution Control Act as amended (33 USC § 1251-1387). The Contractor agrees to 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.

A8 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

Reference: 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.

A9 COPELAND "ANTI-KICKBACK" ACT

Reference: 2 CFR § 200, Appendix II(D); 29 CFR Parts 3 and 5

Contractor must comply with the requirements of the Copeland "Anti-Kickback" Act (18 USC 874 and 40 USC 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.

A10 DAVIS-BACON REQUIREMENTS

Reference: 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.

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;

(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, DC 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 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 that 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 that 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 *www.dol.gov/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) 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) 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 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) 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 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 that 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 USC 1001.

A11 DEBARMENT AND SUSPENSION

Reference: 2 CFR part 180 (Subpart C); 2 CFR part 1200; DOT Order 4200.5

Refer to Division 2, Bidding Documents.

A12 DISADVANTAGED BUSINESS ENTERPRISE

Reference: 49 CFR part 26

Refer to the Instructions to Bidders.

A13 DISTRACTED DRIVING

Reference: 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 Federal Aviation Administration 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 subgrant.

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 that involve driving a motor vehicle in performance of work activities associated with the project.

A14 ENERGY CONSERVATION REQUIREMENTS

Reference: 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 USC 6201*et seq*).

A15 DRUG FREE WORKPLACE REQUIREMENTS

Reference: 49 CFR part 32; Drug-Free Workplace Act of 1988 (41 U.S.C. 701 et seq., as amended)

The Drug-Free Workplace Act of 1988 requires some Federal contractors and *all* Federal grantees to agree that they will provide drug-free workplaces as a condition of receiving a contract or grant from a Federal agency. The Act does ***not*** apply to contractors, subcontractors, or subgrantees, although the Federal grantees workplace may be where the contractors, subcontractors, or subgrantees are working.

A16 EQUAL EMPLOYEMENT OPPORTUNITY (EEO)

Reference: 2 CFR 200, Appendix II(C); 41 CFR § 60-1.4; 41 CFR § 60-4.3; 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 it 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.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS

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);

(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 part 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.

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 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 supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

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 part 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).

A17 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

Reference: 29 USC § 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.

A18 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

Reference: 31 USC § 1352 – Byrd Anti-Lobbying Amendment; 2 CFR part 200, Appendix II(J); 49 CFR part 20, Appendix A

Refer to Division 2, Bidding Documents.

A19 PROHIBITION OF SEGREGATED FACILITIES

Reference: 41 CFR § 60

Refer to Division 2, Bidding Documents.

A20 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

Reference: 29 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. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer 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). The employer 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.

A21 PROCUREMENT OF RECOVERED MATERIALS

Reference: 2 CFR § 200.322; 40 CFR part 247; Solid Waste Disposal Act

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 products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

The contract requires procurement of $10,000 or more of a designated item during the fiscal year; or

1) 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/smm/comprehensive-procurement-guidelines-construction-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.

A22 RIGHT TO INVENTIONS

Reference: 2 CFR § 200, Appendix II(F);37 CFR §401

Contracts or agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the Owner in any resulting invention as established by 37 CFR part 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This contract incorporates by reference the patent and inventions rights as specified within 37 CFR §401.14. Contractor must include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

A23 SEISMIC SAFETY

Reference: 49 CFR part 41

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

A24 TAX DELINQUENCY AND FELONY CONVICTIONS

Reference: Sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 (Pub. L. 113-76), and similar provisions in subsequent appropriations acts.

DOT Order 4200.6 - Requirements for Procurement and Non-Procurement Regarding Tax Delinquency and Felony Convictions

Refer to Division 2, Bidding Documents.

A25 TERMINATION OF CONTRACT

Reference: 2 CFR § 200 Appendix II(B); FAA Advisory Circular 150/5370-10, Section 80-09

TERMINATION FOR CONVENIENCE (CONSTRUCTION & EQUIPMENT CONTRACTS)

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:

1) completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;

2) 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;

3) reasonable and substantiated claims, costs, and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and

4) 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.

TERMINATION FOR DEFAULT (CONSTRUCTION)

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes conditions, rights, and remedies associated with Owner termination of this contract due to default of the Contractor.

TERMINATION FOR DEFAULT (EQUIPMENT)

The Owner may, by written notice of default to the Contractor, terminate all or part of this Contract if the Contractor:

1. Fails to commence the Work under the Contract within the time specified in the Notice- to-Proceed;

2. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;

3. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;

4. Fails to comply with material provisions of the Contract;

5. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements; or

6. Becomes insolvent or declares bankruptcy.

If one or more of the stated events occur, the Owner will give notice in writing to the Contractor and Surety of its intent to terminate the contract for cause. At the Owner's discretion, the notice may allow the Contractor and Surety an opportunity to cure the breach or default.

If within [10] days of the receipt of notice, the Contractor or Surety fails to remedy the breach or default to the satisfaction of the Owner, the Owner has authority to acquire equipment by other procurement action. The Contractor will be liable to the Owner for any excess costs the Owner incurs for acquiring such similar equipment.

Payment for completed equipment delivered to and accepted by the Owner shall be at the Contract price. The Owner may withhold from amounts otherwise due the Contractor for such completed equipment, such sum as the Owner determines to be necessary to protect the Owner against loss because of Contractor default.

Owner will not terminate the Contractor's right to proceed with the Work under this clause if the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such acceptable causes include: acts of God, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, and severe weather events that substantially exceed normal conditions for the location.

If, after termination of the Contractor's right to proceed, the Owner determines that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the Owner issued the termination for the convenience the Owner.

The rights and remedies of the Owner in this clause are in addition to any other rights and remedies provided by law or under this contract.

A26 TRADE RESTRICTION CERTIFICATION

Reference: 49 USC § 50104; 49 CFR part 30

Refer to Division 2, Bidding Documents.

A27 VETERAN'S PREFERENCE

Reference: 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 USC 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.

PART B
GENERAL CONTRACT PROVISIONS

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Section 10 Definition of Terms

When the following terms are used in these specifications, in the contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be defined as follows:

Paragraph Number	Term	Definition
10-01	**AASHTO**	The American Association of State Highway and Transportation Officials.
10-02	**Access Road**	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	**Advertisement**	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	**Airport**	Airport means an area of land or water which 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; airport buildings and facilities located in any of these areas, and a heliport.
10-05	**Airport Improvement Program (AIP)**	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	**Air Operations Area (AOA)**	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.
10-07	**Apron**	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	**ASTM International (ASTM)**	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	**Award**	The Owner's notice to the successful bidder of the acceptance of the submitted bid.
10-10	**Bidder**	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	**Building Area**	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	**Calendar Day**	Every day shown on the calendar.
10-13	**Certificate of Analysis (COA)**	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	**Certificate of Compliance (COC)**	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	**Change Order**	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	**Contract**	A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to:

Paragraph Number	Term	Definition
		Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.
10-17	**Contract Item (Pay Item)**	A specific unit of work for which a price is provided in the contract.
10-18	**Contract Time**	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	**Contractor**	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	**Contractors Quality Control (QC) Facilities**	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	**Contractor Quality Control Program (CQCP)**	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	**Control Strip**	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	**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.
10-24	**Drainage System**	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	**Engineer**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	**Equipment**	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.
10-27	**Extra Work**	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	**FAA**	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	**Federal Specifications**	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared

Paragraph Number	Term	Definition
		and issued by the General Services Administration.
10-30	**Force Account**	**a.** Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. **b.** Owner Force Account - Work performed for the project by the Owner's employees.
10-31	**Intention of Terms**	Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.
10-32	**Lighting**	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	**Major and Minor Contract Items**	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	**Materials**	Any substance specified for use in the construction of the contract work.
10-35	**Modification of Standards (MOS)**	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	**Notice to Proceed (NTP)**	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	**Owner**	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is Barkley Regional Airport Authority.
10-38	**Passenger Facility Charge (PFC)**	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	**Pavement Structure**	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	**Payment bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the

Paragraph Number	Term	Definition
		construction of the work.
10-41	**Performance bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	**Plans**	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	**Project**	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	**Proposal**	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	**Proposal guaranty**	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	**Quality Assurance (QA)**	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	**Quality Control (QC)**	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	**Quality Assurance (QA) Inspector**	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	**Quality Assurance (QA) Laboratory**	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	**Resident Project Representative (RPR)**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	**Runway**	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	**Runway Safety Area (RSA)**	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	**Safety Plan Compliance Document (SPCD)**	Details how the Contractor will comply with the CSPP.
10-54	**Specifications**	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	**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

Paragraph Number	Term	Definition
		public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	**Structures**	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	**Subgrade**	The soil that forms the pavement foundation.
10-58	**Superintendent**	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	**Supplemental Agreement**	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	**Surety**	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	**Taxilane**	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	**Taxiway**	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.
10-63	**Taxiway/Taxilane Safety Area (TSA)**	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	**Work**	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	**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.
10-66	**Owner Defined terms**	None

END OF SECTION 10

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Section 20 Proposal Requirements and Conditions

20-01 Advertisement (Notice to Bidders). The advertisement is located elsewhere in the contract documents.

20-02 Qualification of bidders. Each bidder shall submit evidence of competency and evidence of financial responsibility to perform the work to the Owner at the time of bid opening.

Evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work. Each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. Evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether their financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a bidder may submit evidence that they are prequalified with the State Highway Division and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.

20-03 Contents of proposal forms. The Owner's proposal forms state the location and description of the proposed construction; the place, date, and time of opening of the proposals; and the estimated quantities of the various items of work to be performed and materials to be furnished for which unit bid prices are asked. The proposal form states the time in which the work must be completed, and the amount of the proposal guaranty that must accompany the proposal. The Owner will accept only those Proposals properly executed on physical forms or electronic forms provided by the Owner. Bidder actions that may cause the Owner to deem a proposal irregular are given in paragraph 20-09 *Irregular proposals*.

Mobilization is limited to 10 percent (10%) of the total project cost.

A prebid conference is required on this project to discuss as a minimum, the following items: material requirements; submittals; Quality Control/Quality Assurance requirements; the construction safety and phasing plan including airport access and staging areas; and unique airfield paving construction requirements.

20-04 Issuance of proposal forms. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder if the bidder is in default for any of the following reasons:

a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.
b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective bidder.
c. Documented record of Contractor default under previous contracts with the Owner.
d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-05 Interpretation of estimated proposal quantities. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is

understood that the quantities may be increased or decreased as provided in the Section 40, paragraph 40-02, Alteration of Work and Quantities, without in any way invalidating the unit bid prices.

20-06 Examination of plans, specifications, and site. The bidder is expected to carefully examine the site of the proposed work, the proposal, plans, specifications, and contract forms. Bidders shall satisfy themselves to the character, quality, and quantities of work to be performed, materials to be furnished, and to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied to the conditions to be encountered in performing the work and the requirements of the proposed contract, plans, and specifications.

Boring logs and other records of subsurface investigations and tests are available for inspection of bidders. It is understood and agreed that such subsurface information, whether included in the plans, specifications, or otherwise made available to the bidder, was obtained and is intended for the Owner's design and estimating purposes only. Such information has been made available for the convenience of all bidders. It is further understood and agreed that each bidder is solely responsible for all assumptions, deductions, or conclusions which the bidder may make or obtain from their own examination of the boring logs and other records of subsurface investigations and tests that are furnished by the Owner.

20-07 Preparation of proposal. The bidder shall submit their proposal on the forms furnished by the Owner. All blank spaces in the proposal forms, unless explicitly stated otherwise, must be correctly filled in where indicated for each and every item for which a quantity is given. The bidder shall state the price (written in ink or typed) both in words and numerals which they propose for each pay item furnished in the proposal. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall correctly sign the proposal in ink. If the proposal is made by an individual, their name and post office address must be shown. If made by a partnership, the name and post office address of each member of the partnership must be shown. If made by a corporation, the person signing the proposal shall give the name of the state where the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a proposal as an agent shall file evidence of their authority to do so and that the signature is binding upon the firm or corporation.

20-08 Responsive and responsible bidder. A responsive bid conforms to all significant terms and conditions contained in the Owner's invitation for bid. It is the Owner's responsibility to decide if the exceptions taken by a bidder to the solicitation are material or not and the extent of deviation it is willing to accept.

A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 2 CFR § 200.318(h). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

20-09 Irregular proposals. Proposals shall be considered irregular for the following reasons:

- **a.** If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.
- **b.** If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.
- **c.** If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.
- **d.** If the proposal contains unit prices that are obviously unbalanced.
- **e.** If the proposal is not accompanied by the proposal guaranty specified by the Owner.
- **f.** If the applicable Disadvantaged Business Enterprise information is incomplete.

The Owner reserves the right to reject any irregular proposal and the right to waive technicalities if such waiver is in the best interest of the Owner and conforms to local laws and ordinances pertaining to the letting of construction contracts.

20-10 Bid guarantee. Each separate proposal shall be accompanied by a bid bond, certified check, or other specified acceptable collateral, in the amount specified in the proposal form. Such bond, check, or collateral, shall be made payable to the Owner.

20-11 Delivery of proposal. Each proposal submitted shall be placed in a sealed envelope plainly marked with the project number, location of airport, and name and business address of the bidder on the outside. When sent by mail, preferably registered, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. No proposal will be considered unless received at the place specified in the advertisement or as modified by Addendum before the time specified for opening all bids. Proposals received after the bid opening time shall be returned to the bidder unopened.

20-12 Withdrawal or revision of proposals. A bidder may withdraw or revise (by withdrawal of one proposal and submission of another) a proposal provided that the bidder's request for withdrawal is received by the Owner in writing before the time specified for opening bids. Revised proposals must be received at the place specified in the advertisement before the time specified for opening all bids.

20-13 Public opening of proposals. Proposals shall be opened, and read, publicly at the time and place specified in the advertisement. Bidders, their authorized agents, and other interested persons are invited to attend. Proposals that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids shall be returned to the bidder unopened.

20-14 Disqualification of bidders. A bidder shall be considered disqualified for any of the following reasons:

- **a.** Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.
- **b.** Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.
- **c.** If the bidder is considered to be in "default" for any reason specified in paragraph 20-04, *Issuance of Proposal Forms,* of this section.

20-15 Discrepancies and Omissions. A Bidder who discovers discrepancies or omissions with the project bid documents shall immediately notify the Owner's Engineer of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the Owner's Engineer a written request for interpretation no later than seven (7) days prior to bid opening.

Any interpretation of the project bid documents by the Owner's Engineer will be by written addendum issued by the Owner. The Owner will not consider any instructions, clarifications or interpretations of the bidding documents in any manner other than written addendum.

END OF SECTION 20

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Section 30 Award and Execution of Contract

30-01 Consideration of proposals. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit bid price written in words shall govern.

Until the award of a contract is made, the Owner reserves the right to reject a bidder's proposal for any of the following reasons:

a. If the proposal is irregular as specified in Section 20, paragraph 20-09, *Irregular Proposals*.
b. If the bidder is disqualified for any of the reasons specified Section 20, paragraph 20-14, *Disqualification of Bidders*.

In addition, until the award of a contract is made, the Owner reserves the right to reject any or all proposals, waive technicalities, if such waiver is in the best interest of the Owner and is in conformance with applicable state and local laws or regulations pertaining to the letting of construction contracts; advertise for new proposals; or proceed with the work otherwise. All such actions shall promote the Owner's best interests.

30-02 Award of contract. The award of a contract, if it is to be awarded, shall be made within **90** calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

If the Owner elects to proceed with an award of contract, the Owner will make award to the responsible bidder whose bid, conforming with all the material terms and conditions of the bid documents, is the lowest in price.

30-03 Cancellation of award. The Owner reserves the right to cancel the award without liability to the bidder, except return of proposal guaranty, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with paragraph 30-07 *Approval of Contract*.

30-04 Return of proposal guaranty. All proposal guaranties, except those of the two lowest bidders, will be returned immediately after the Owner has made a comparison of bids as specified in the paragraph 30-01, *Consideration of Proposals.* Proposal guaranties of the two lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's proposal guaranty will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in paragraph 30-05, *Requirements of Contract Bonds.*

30-05 Requirements of contract bonds. At the time of the execution of the contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the work. The surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the surety bond or bonds shall be in a sum equal to the full amount of the contract.

30-06 Execution of contract. The successful bidder shall sign (execute) the necessary agreements for entering into the contract and return the signed contract to the Owner, along with the fully executed surety bond or bonds specified in paragraph 30-05, *Requirements of Contract Bonds,* of this section, within **15** calendar days from the date mailed or otherwise delivered to the successful bidder.

30-07 Approval of contract. Upon receipt of the contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract.

30-08 Failure to execute contract. Failure of the successful bidder to execute the contract and furnish an acceptable surety bond or bonds within the period specified in paragraph 30-06, *Execution of Contract,* of this section shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidated damages to the Owner.

END OF SECTION 30

Section 40 Scope of Work

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, *Payment for Omitted Items*.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work. When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.
If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

40-05 Maintenance of traffic. 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. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. 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 Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.
b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).
c. When the contract requires the maintenance of 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 the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions 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 (MUTCD) (http://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.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.
Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.
Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,
b. Remove such material from the site, upon written approval of the RPR; or
c. Use such material for the Contractor's own temporary construction on site; or,
d. Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

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Section 50 Control of Work

50-01 Authority of the Resident Project Representative (RPR). The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.

50-02 Conformity with plans and specifications. All work and all materials furnished shall be in reasonably close conformity with the lines, grades, grading sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans, or specifications.

If the RPR finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications, but that the portion of the work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the RPR will advise the Owner of their determination that the affected work be accepted and remain in place. The RPR will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. Changes in the contract price must be covered by contract change order or supplemental agreement as applicable.

If the RPR finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the plans and specifications and have resulted in an unacceptable finished product, the affected work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the RPR's written orders.

The term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the work in accordance with the contract, plans, and specifications. The term shall not be construed as waiving the RPR's responsibility to insist on strict compliance with the requirements of the contract, plans, and specifications during the Contractor's execution of the work, when, in the RPR's opinion, such compliance is essential to provide an acceptable finished portion of the work.

The term "reasonably close conformity" is also intended to provide the RPR with the authority, after consultation with the Sponsor and FAA, to use sound engineering judgment in their determinations to accept work that is not in strict conformity but will provide a finished product equal to or better than that required by the requirements of the contract, plans and specifications.

The RPR will not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard test methods, the Contractor shall immediately ask the RPR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify the Owner or the designated representative in writing requesting their written interpretation and decision.

50-04 List of Special Provisions. None.

50-05 Cooperation of Contractor. The Contractor shall be supplied with an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

The Contractor shall give constant attention to the work to facilitate the progress thereof and shall cooperate with the RPR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent superintendent on the work at all times who is fully authorized as their agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the RPR or their authorized representative.

50-06 Cooperation between Contractors. The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the work not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with their own contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange their work and shall place and dispose of the materials being used to not interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join their work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

50-07 Construction layout and stakes. The Engineer / RPR shall establish necessary horizontal and vertical control. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving the integrity of horizontal and vertical controls. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the RPR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the RPR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): Legible hardcopy and legible PDF.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

50-08 Authority and duties of Quality Assurance (QA) inspectors. QA inspectors shall be authorized to inspect all work done and all material furnished. Such QA inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify the Contractor or their representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the RPR for a decision.

50-09 Inspection of the work. All materials and each part or detail of the work shall be subject to inspection. The RPR shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the RPR requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

Provide advance written notice to the RPR of work the Contractor plans to perform each week and each day. Any work done or materials used without written notice and allowing opportunity for inspection by the RPR may be ordered removed and replaced at the Contractor's expense.

Should the contract work include relocation, adjustment, or any other modification to existing facilities, not the property of the (contract) Owner, authorized representatives of the Owners of such facilities shall have the right to inspect such work. Such inspection shall in no sense make any facility owner a party to the contract, and shall in no way interfere with the rights of the parties to this contract.

50-10 Removal of unacceptable and unauthorized work. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the RPR as provided in paragraph 50-02, *Conformity with Plans and Specifications*.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, *Contractor's Responsibility for Work*.

No removal work made under provision of this paragraph shall be done without lines and grades having been established by the RPR. Work done contrary to the instructions of the RPR, work done beyond the lines shown on the plans or as established by the RPR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the RPR made under the provisions of this subsection, the RPR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and recover the resulting costs as a liquidated damage against the Contractor.

50-11 Load restrictions. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-12 Maintenance during construction. 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, and the Contractor will not be paid an additional amount for such work.

50-13 Failure to maintain the work. Should the Contractor at any time fail to maintain the work as provided in paragraph 50-12, *Maintenance during Construction*, the RPR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the RPR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be recovered as a liquidated damage against the Contractor.

50-14 Partial acceptance. If at any time during the execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the RPR to make final inspection of that unit. If the RPR finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the RPR may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

50-15 Final acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the RPR and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be complete in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection. The RPR shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations.

50-17 Value Engineering Cost Proposal. The provisions of this paragraph will apply only to contracts awarded to the lowest bidder pursuant to competitive bidding.

On projects with original contract amounts in excess of $100,000, the Contractor may submit to the RPR, in writing, proposals for modifying the plans, specifications or other requirements of the contract for the sole purpose of reducing the cost of construction. The value engineering cost 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, design and safety standards. This provision shall not apply unless the proposal submitted is specifically identified by the Contractor as being presented for consideration as a value engineering proposal.

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

As a minimum, the following information shall be submitted by the Contractor with each proposal:

a. A description of both existing contract requirements for performing the work and the proposed changes, with a discussion of the comparative advantages and disadvantages of each.
b. An itemization of the contract requirements that must be changed if the proposal is adopted.
c. A detailed estimate of the cost of performing the work under the existing contract and under the proposed changes.
d. A statement of the time by which a change order adopting the proposal must be issued.
e. A statement of the effect adoption of the proposal will have on the time for completion of the contract.
f. The contract items of work affected by the proposed changes, including any quantity variation attributable to them.

The Contractor may withdraw, in whole or in part, any value engineering cost proposal not accepted by the RPR, within the period specified in the proposal. The provisions of this subsection shall not be construed to require the RPR to consider any value engineering cost proposal that may be submitted.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until a change order incorporating the value engineering cost proposal has been issued. If a change order has not been issued by the date upon which the Contractor's value engineering cost proposal specifies that a decision should be made, or such other date as the Contractor may subsequently have requested in writing, such value engineering cost proposal shall be deemed rejected.

The RPR shall be the sole judge of the acceptability of a value engineering cost proposal and of the estimated net savings from the adoption of all or any part of such proposal. In determining the estimated net savings, the RPR may disregard the contract bid prices if, in the RPR's judgment, such prices do not represent a fair measure of the value of the work to be performed or deleted.

The Owner may require the Contractor to share in the Owner's costs of investigating a value engineering cost proposal submitted by the Contractor as a condition of considering such proposal. Where such a condition is imposed, the Contractor shall acknowledge acceptance of it in writing. Such acceptance shall constitute full authority for the Owner to deduct the cost of investigating a value engineering cost proposal from amounts payable to the Contractor under the contract.

If the Contractor's value engineering cost proposal is accepted in whole or in part, such acceptance will be by a contract change order that shall specifically state that it is executed pursuant to this paragraph. Such change order shall incorporate the changes in the plans and specifications which are necessary to permit the value engineering

cost proposal or such part of it as has been accepted and shall include any conditions upon which the RPR's approval is based. The change order shall also set forth the estimated net savings attributable to the value engineering cost proposal. The net savings shall be determined as the difference in costs between the original contract costs for the involved work items and the costs occurring as a result of the proposed change. The change order shall also establish the net savings agreed upon and shall provide for adjustment in the contract price that will divide the net savings equally between the Contractor and the Owner.

The Contractor's 50% share of the net savings shall constitute full compensation to the Contractor for the value engineering cost proposal and the performance of the work.

Acceptance of the value engineering cost proposal and performance of the work shall not extend the time of completion of the contract unless specifically provided for in the contract change order.

END OF SECTION 50

Section 60 Control of Materials

60-01 Source of supply and quality requirements. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish documentation to the RPR as to the origin, composition, and manufacture of all materials to be used in the work. Documentation shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the RPR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, *Airport Lighting Equipment Certification Program* and *Addendum*, that is in effect on the date of advertisement.

60-02 Samples, tests, and cited specifications. All materials used in the work shall be inspected, tested, and approved by the RPR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the RPR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the RPR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR.

A copy of all Contractor QC test data shall be provided to the RPR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the RPR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP).

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the RPR.

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "or equal," the Contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

a. Conformance to the specified performance, testing, quality or dimensional requirements; and,
b. Suitability of the material or assembly for the use intended in the contract work.

The RPR shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The RPR reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-04 Plant inspection. The RPR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the RPR conduct plant inspections, the following conditions shall exist:

a. The RPR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.
b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.
c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The RPR shall have the right to reject only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

60-05 Engineer/ Resident Project Representative (RPR) field office. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity.

60-06 Storage of materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at their expense, except as otherwise agreed to (in writing) by the Owner or lessee of the property.

60-07 Unacceptable materials. Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the RPR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the RPR has approved its use in the work.

60-08 Owner furnished materials. The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the unit price bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

END OF SECTION 60

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Section 70 Legal Regulations and Responsibility to Public

70-01 Laws to be observed. The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 Permits, licenses, and taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-03 Patented devices, materials, and processes. If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the work.

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows: None.

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the RPR.

Should the Owner of public or private utility service, FAA, or NOAA facility, 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 RPR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. 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.

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

70-06 Sanitary, health, and safety provisions. The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-07 Public convenience and safety. The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40,

paragraph 40-05, *Maintenance of Traffic,* and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.
The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is located in the project plans.

70-09 Use of explosives. The use of explosives is not permitted on this project.

70-10 Protection and restoration of property and landscape. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the execution of the work, resulting from any act, omission, neglect, or misconduct in manner or method of executing the work, or at any time due to defective work or materials, and said responsibility shall not be released until the project has been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at their expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

70-12 Third party beneficiary clause. It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create for the public or any member thereof, a third-party beneficiary or to authorize anyone not a party to the contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the contract.

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work must be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.
No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings 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 which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their 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.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-14 Contractor's responsibility for work. Until the RPR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-15 Contractor's responsibility for utility service and facilities of others. As provided in paragraph 70-04, *Restoration of Surfaces Disturbed by Others*, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans and/or in the contract documents.

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of the responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The

Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.
In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's "Person to Contact" no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the RPR.

The Contractor's failure to give the two days' notice shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, the Contractor shall immediately notify the proper authority and the RPR and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the RPR continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-15.1 FAA facilities and cable runs. The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project work, shall comply with the following:

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.
b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.
c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.
d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.
e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.
70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

70-19 Environmental protection. 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, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. 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 their operations, any building, 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 RPR. The RPR will immediately investigate the Contractor's finding and the Owner will 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 or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work,* and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. Refer to Division 4 – Supplementary Conditions.

END OF SECTION 70

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Section 80 Execution and Progress

80-01 Subletting of contract. The Owner will not recognize any subcontractor on the work. The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Resident Project Representative (RPR).

The Contractor shall perform, with his organization, an amount of work equal to at least 40 percent of the total contract cost.

Should the Contractor elect to assign their contract, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner.

The Contractor shall provide copies of all subcontracts to the RPR 14 days prior to being utilized on the project. As a minimum, the information shall include the following:

- Subcontractor's legal company name.
- Subcontractor's legal company address, including County name.
- Principal contact person's name, telephone and fax number.
- Complete narrative description, and dollar value of the work to be performed by the subcontractor.
- Copies of required insurance certificates in accordance with the specifications.
- Minority/ non-minority status.

80-02 Notice to proceed (NTP). The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within one day of the NTP date. The Contractor shall notify the RPR at least 48 hours in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

80-03 Execution and progress. Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least 14 days prior to the start of work. The Contractor's progress schedule, once accepted by the RPR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The RPR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR at least 48 hours in advance of resuming operations.

The Contractor shall not commence any actual construction prior to the date on which the NTP is issued by the Owner.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a weekly basis, or as otherwise specified in the contract. Submission of the work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all work to comply with the requirements of the contract.

80-04 Limitation of operations. The Contractor shall control their operations and the operations of their subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

When the work requires the Contractor to conduct their operations within an AOA of the airport, the work shall be coordinated with airport operations (through the RPR) at least 48 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the RPR and until the necessary temporary marking, signage and associated lighting is in place as provided in Section 70, paragraph 70-08, *Construction Safety and Phasing Plan (CSPP)*.

When the contract 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; and 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 satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently as follows:

The Contractor shall be required to conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction and the approved CSPP.

80-04.1 Operational safety on airport during construction. All Contractors' operations shall be conducted in accordance with the approved project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. 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 SPCD that details how it proposes to comply with the requirements presented within the CSPP.

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.

The Contractor is responsible to the Owner 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 SPCD and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved CSPP and SPCD unless approved in writing by the Owner. The necessary coordination actions to review Contractor proposed modifications to an approved CSPP or approved SPCD can require a significant amount of time.

80-05 Character of workers, methods, and equipment. The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the RPR, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the RPR, be removed immediately by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without approval of the RPR.

Should the Contractor fail to remove such person or persons, or fail to furnish suitable and sufficient personnel for the proper execution of the work, the RPR may suspend the work by written notice until compliance with such orders.
All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall not cause injury to previously completed work, adjacent property, or existing airport facilities due to its use.

When the methods and equipment to be used by the Contractor in accomplishing the work are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the contract, plans, and specifications.

When the contract specifies the use of certain methods and equipment, such methods and equipment shall be used unless otherwise authorized by the RPR. If the Contractor desires to use a method or type of equipment other than specified in the contract, the Contractor may request authority from the RPR to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the RPR determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the RPR may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this paragraph.

80-06 Temporary suspension of the work. The Owner shall have the authority to suspend the work wholly, or in part, for such period or periods the Owner may deem necessary, due to unsuitable weather, or other conditions considered unfavorable for the execution of the work, or for such time necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract.

In the event that the Contractor is ordered by the Owner, in writing, to suspend work for some unforeseen cause not otherwise provided for in the contract and over which the Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the written order to suspend work to the effective date of the written order to resume the work. Claims for such compensation shall be filed with the RPR within the time period stated in the RPR's order to resume work. The Contractor shall submit with their own claim information substantiating the amount shown on the claim. The RPR will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

If it becomes necessary to suspend work for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. The Contractor shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work.

The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

80-07 Determination and extension of contract time. The number of calendar days and the completion date shall be stated in the proposal and contract and shall be known as the Contract Time.

If the contract time requires extension for reasons beyond the Contractor's control, it shall be adjusted as follows:

80-07.1 Contract time based on calendar days. Contract Time based on calendar days shall consist of the number of calendar days stated in the contract counting from the effective date of the Notice to Proceed and including all

Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

At the time of final payment, the contract time shall be increased in the same proportion as the cost of the actually completed quantities bears to the cost of the originally estimated quantities in the proposal. Such increase in the contract time shall not consider either cost of work or the extension of contract time that has been covered by a change order or supplemental agreement. Charges against the contract time will cease as of the date of final acceptance.

80-08 Failure to complete on time. For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time (including all extensions and adjustments as provided in paragraph 80-07, *Determination and Extension of Contract Time*) the sum specified in the contract and proposal as liquidated damages (LD) will be deducted from any money due or to become due the Contractor or their own surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract.

Schedule	Liquidated Damages Cost	Allowed Construction Time
Taxiway Bravo West Relocation	**$1,500.00 per calendar day**	**240 consecutive calendar days**

The maximum construction time allowed for this project is 240 consecutive calendar days. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the contract.

80-09 Default and termination of contract. The Contractor shall be considered in default of their contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons, if the Contractor:

a. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or
b. Fails to perform the work or fails to provide sufficient workers, equipment and/or materials to assure completion of work in accordance with the terms of the contract, or
c. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or
d. Discontinues the execution of the work, or
e. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or
f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or
h. Makes an assignment for the benefit of creditors, or
i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

Should the Owner consider the Contractor in default of the contract for any reason above, the Owner shall immediately give written notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the contract.

If the Contractor or surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the RPR of the facts of such delay, neglect, or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the execution of the work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof or use such other methods as in the opinion of the RPR will be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the Owner, together with the cost of completing the work under contract, will be deducted from any monies due or which may become due the Contractor. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay to the Owner the amount of such excess.

80-10 Termination for national emergencies. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the execution of war or in the interest of national defense.
When the contract, or any portion thereof, is terminated before completion of all items of work in the contract, payment will be made for the actual number of units or items of work completed at the contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

Reimbursement for organization of the work, and other overhead expenses, (when not otherwise included in the contract) and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the Contractor.

Acceptable materials, obtained or ordered by the Contractor for the work and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor at actual cost as shown by receipted bills and actual cost records at such points of delivery as may be designated by the RPR.

Termination of the contract or a portion thereof shall neither relieve the Contractor of their responsibilities for the completed work nor shall it relieve their surety of its obligation for and concerning any just claim arising out of the work performed.

80-11 Work area, storage area and sequence of operations. The Contractor shall obtain approval from the RPR prior to beginning any work in all areas of the airport. No operating runway, taxiway, or air operations area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate work in accordance with the approved CSPP and SPCD.

END OF SECTION 80

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Section 90 Measurement and Payment

90-01 Measurement of quantities. All work completed under the contract will be measured by the RPR, or their authorized representatives, using United States Customary Units of Measurement.

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.

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 9 square feet (0.8 square meters) 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 RPR.

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.

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.

When requested by the Contractor and approved by the RPR in writing, material specified to be measured by the cubic yard (cubic meter) may be weighed, and such weights will be converted to cubic yards (cubic meters) for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the RPR and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term "ton" will mean the short ton consisting of 2,000 pounds (907 km) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	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.
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.

Term	Description
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	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.
Plates and Sheets	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.
Miscellaneous Items	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.
Scales	Scales must be tested for accuracy and serviced before use. 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. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been "overweighing" (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%. In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded. Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. 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 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.
Rental Equipment	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. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work*.
Pay Quantities	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 RPR. 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.

90-02 Scope of payment. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials, for performing all work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the execution thereof, subject to the provisions of Section 70, paragraph 70-18, *No Waiver of Legal Rights*.

When the "basis of payment" subsection of a technical specification requires that the contract price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other contract item which may appear elsewhere in the contract, plans, or specifications.

90-03 Compensation for altered quantities. When the accepted quantities of work vary from the quantities in the proposal, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-02, *Alteration of Work and Quantities,* will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor which results directly from such alterations or indirectly from their own unbalanced allocation of overhead and profit among the contract items, or from any other cause.

90-04 Payment for omitted items. As specified in Section 40, paragraph 40-03, *Omitted Items,* the RPR shall have the right to omit from the work (order nonperformance) any contract item, except major contract items, in the best interest of the Owner.

Should the RPR omit or order nonperformance of a contract item or portion of such item from the work, the Contractor shall accept payment in full at the contract prices for any work actually completed and acceptable prior to the RPR's order to omit or non-perform such contract item.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the RPR's order will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted contract item prior to the date of the RPR's order. Such additional costs incurred by the Contractor must be directly related to the deleted contract item and shall be supported by certified statements by the Contractor as to the nature the amount of such costs.

90-05 Payment for extra work. Extra work, performed in accordance with Section 40, paragraph 40-04, *Extra Work*, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work.

90-06 Partial payments. Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the RPR, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with paragraph 90-07, *Payment for Materials on Hand*. No partial payment will be made when the amount due to the Contractor since the last estimate amounts to less than five hundred dollars.

a. From the total of the amount determined to be payable on a partial payment, 10% percent of such total amount will be deducted and retained by the Owner for protection of the Owner's interests. Unless otherwise instructed by the Owner, the amount retained by the Owner will be in effect until the final payment is made except as follows:

(1) Contractor may request release of retainage on work that has been partially accepted by the Owner in accordance with Section 50-14. Contractor must provide a certified invoice to the RPR that supports the value of retainage held by the Owner for partially accepted work.

(2) In lieu of retainage, the Contractor may exercise at its option the establishment of an escrow account per paragraph 90-08.

b. The Contractor is required to pay all subcontractors for satisfactory performance of their contracts no later than 30 days after the Contractor has received a partial payment. Contractor must provide the Owner evidence of prompt and full payment of retainage held by the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the Owner. When the Owner has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

c. When at least 95% of the work has been completed to the satisfaction of the RPR, the RPR shall, at the Owner's discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done. The Owner may retain an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor.

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in paragraph 90-09, *Acceptance and Final Payment*.

The Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

90-07 Payment for materials on hand. Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans, and specifications and are delivered to acceptable sites on the airport property or at other sites in the vicinity that are acceptable to the Owner. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

a. The material has been stored or stockpiled in a manner acceptable to the RPR at or on an approved site.
b. The Contractor has furnished the RPR with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
c. The Contractor has furnished the RPR with satisfactory evidence that the material and transportation costs have been paid.
d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.
e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of their responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications.

In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.

No partial payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this paragraph.

90-08 Payment of withheld funds. At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in paragraph 90-06 *Partial Payments*, the Contractor may request that the Owner deposit the retainage into an escrow account. The Owner's deposit of retainage into an escrow account is subject to the following conditions:

a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.
b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.
c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.
d. The Contractor shall obtain the written consent of the surety to such agreement.

90-09 Acceptance and final payment. When the contract work has been accepted in accordance with the requirements of Section 50, paragraph 50-15, *Final Acceptance*, the RPR will prepare the final estimate of the items of work actually performed. The Contractor shall approve the RPR's final estimate or advise the RPR of the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the RPR shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the RPR's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the RPR's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with Section 50, paragraph 50-16, *Claims for Adjustment and Disputes*.

After the Contractor has approved, or approved under protest, the RPR's final estimate, and after the RPR's receipt of the project closeout documentation required in paragraph 90-11, *Contractor Final Project Documentation*, final payment will be processed based on the entire sum, or the undisputed sum in case of approval under protest, determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a claim for additional compensation under the provisions of Section 50, paragraph 50-16, *Claims for Adjustments and Disputes,* or under the provisions of this paragraph, such claims will be considered by the Owner in accordance with local laws or ordinances. Upon final adjudication of such claims, any additional payment determined to be due the Contractor will be paid pursuant to a supplemental final estimate.

90-10 Construction warranty.

a. 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, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.
b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession.
c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements; or any defect of equipment, material, workmanship, or design furnished by the Contractor.
d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.
e. The Owner will notify the Contractor, in writing, within seven (7) days after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.
h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

90-11 Contractor Final Project Documentation. Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the RPR approves the Contractor's final submittal. The Contractor shall:

a. Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.
b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.
c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *Final Cleanup*.
d. Complete all punch list items identified during the Final Inspection.
e. Provide complete release of all claims for labor and material arising out of the Contract.
f. Provide 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.
g. When applicable per state requirements, return copies of sales tax completion forms.
h. Manufacturer's certifications for all items incorporated in the work.
i. All required record drawings, as-built drawings or as-constructed drawings.
j. Project Operation and Maintenance (O&M) Manual(s).
k. Security for Construction Warranty.
l. Equipment commissioning documentation submitted, if required.

END OF SECTION 90

Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed, and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.
The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled, and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 Temporary erosion and pollution control work required will be performed as scheduled or directed by the RPR. Completed and accepted work will be measured as follows:

a. Temporary seeding and mulching will be measured by the square yard.

b. Temporary slope drains will be measured by the linear foot.

c. Temporary benches, dikes, dams, and sediment basins will be measured by the cubic yard of excavation performed, including necessary cleaning of sediment basins, and the cubic yard of embankment placed as directed by the RPR.

d. All fertilizing will be measured by the ton.

e. Installation and removal of silt fence will be measured by the linear foot.

f. Installation and removal of silt checks will be measured by each location silt checks are installed and accepted by the RPR, regardless of the number of geotextile bags utilized at each location. Individual geotextile bags and stone filler material will not be measured for payment.

102-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

102-5.1 Not Used

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with Section 90, paragraph 90-05 *Payment for Extra Work*.

REFERENCES

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

Advisory Circulars (AC)

AC 150/5200-33	*Hazardous Wildlife Attractants on or Near Airports*
AC 150/5370-2	*Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461	*Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

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Item C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

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

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.

b. Locate the random sampling position within the sublot in accordance with the requirements of the specification.

c. Make a measurement at each location or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.

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

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

Where: X = Sample average of all sublot test values within a lot

$x_1, x_2, \ldots x_n$ = Individual sublot test values

n = Number of sublot test values

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

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

Where: S_n = Sample standard deviation of the number of sublot test values in the set

$d_1, d_2, \ldots d_n$ = Deviations of the individual sublot test values $x_1, x_2, \ldots$ from the average value X

that is: $d_1 = (x_1 - X)$, $d_2 = (x_2 - X) \ldots d_n = (x_n - X)$

n = Number of sublot test values

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

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

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L, using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

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

$$Q_L = (X - L) / S_n$$
and
$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

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

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

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

EXAMPLE OF PWL CALCULATION

Project: Example Project
Test Item: Item P-401, Lot A.
A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 = 96.60
A-2 = 97.55
A-3 = 99.30
A-4 = 98.35
n = 4

2. Calculate average density for the lot.

$X = (x_1 + x_2 + x_3 + \ldots x_n) / n$
$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$
X = 97.95% density

3. Calculate the standard deviation for the lot.

$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2)) / (4 - 1)]^{1/2}$
$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$
$S_n = 1.15$

4. Calculate the Lower Quality Index Q_L for the lot. (L=96.3)

$Q_L = (X - L) / S_n$
$Q_L = (97.95 - 96.30) / 1.15$
$Q_L = 1.4348$

5. Determine PWL by entering Table 1 with Q_L= 1.44 and n= 4.

PWL = 98

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

A-1 = 5.00
A-2 = 3.74
A-3 = 2.30
A-4 = 3.25

2. Calculate the average air voids for the lot.

$X = (x_1 + x_2 + x_3 \ldots n) / n$
$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$
$X = 3.57\%$

3. Calculate the standard deviation S_n for the lot.

$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$
$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$
$S_n = 1.12$

4. Calculate the Lower Quality Index Q_L for the lot. (L= 2.0)

$Q_L = (X - L) / S_n$
$Q_L = (3.57 - 2.00) / 1.12$
$Q_L = 1.3992$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and n = 4.

$P_L = 97$

6. Calculate the Upper Quality Index Q_U for the lot. (U= 5.0)

$Q_U = (U - X) / S_n$
$Q_U = (5.00 - 3.57) / 1.12$
$Q_U = 1.2702$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and n = 4.

$P_U = 93$

8. Calculate Air Voids PWL

$PWL = (P_L + P_U) - 100$
$PWL = (97 + 93) - 100 = 90$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project
Test Item: Item P-401, Lot A.
A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

A-3 = 99.30
A-4 = 98.35
A-2 = 97.55
A-1 = 96.60

2. From ASTM E178, Table 1, for n=4 an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

a. For measurements greater than the average:

If (measurement - average)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-3, check if (99.30 - 97.95) / 1.15 is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

b. For measurements less than the average:

If (average - measurement)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-1, check if (97.95 - 96.60) / 1.15 is greater than 1.463.

Since 1.435 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

Greater than (97.95 + 1.463 × 1.15) = 99.63%

OR

less than (97.95 - 1.463 × 1.15) = 96.27%.

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

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

REFERENCES

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

ASTM International (ASTM)

ASTM E178 Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

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PART C
SUPPLEMENTARY CONDITIONS

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The following conditions amend or supplement the referenced "Standard Federal Aviation Administration General Provisions". All provisions which are not so amended or supplemented remain in full force and effect.

SECTION 10 DEFINITION OF TERMS

SC-1 DELETE THE FOLLOWING DEFINITIONS AND REPLACE WITH THE FOLLOWING DEFINITIONS:

DELETE "10-16 CONTRACT"; REPLACE WITH:

10-16 CONTRACT. The written agreement between Owner and Contractor covering the Work to be performed; other Contract Documents are attached to the Contract and made a part thereof as provided therein. The term "Agreement" has the same meaning as "Contract".

DELETE "10-18 CONTRACT TIME"; REPLACE WITH:

10-18 CONTRACT TIME. The number of calendar days stated in the Bid, allowed for completion of the contract, plus authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar days, the contract shall be completed by that date. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation."

DELETE "10-25 ENGINEER"; REPLACE WITH:

10-25 ENGINEER. The person, firm or corporation named as such in the Agreement.

DELETE "10-60 SURETY"; REPLACE WITH:

10-60 SURETY. The corporate body which is bound with the CONTRACTOR and which engages to be responsible for the CONTRACTOR and his acceptable performance of the work and his payment of all debts pertaining to the work.

DELETE "10-64 WORK"; REPLACE WITH:

10-64 WORK. The entire complete construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

SC-2 AFTER THE LAST DEFINITION OF SECTION 10, ADD THE FOLLOWING NEW DEFINITIONS:

10-67 ADVISORY CIRCULAR. A document issued by the FAA containing informational material and guidance. When referred to in the plans and specifications, advisory circulars shall have the same force as supplemental specifications.

10-68 FEDERAL AVIATION REGULATION (FAR). A document issued by the FAA containing informational material and guidance. When referred to in the plans and specifications, FARs shall have the same force as supplemental specifications.

10-69 GENERAL CONTRACT PROVISIONS. Standard FAA conditions of the Contract identified as Sections 10, 20, 30, 40, 50, 60, 70, 80, and 90.

10-70 GENERAL CONSTRUCTION ITEMS. Standard FAA conditions of the Contract identified as Sections 100, 102, 105 and 110.

10-71 MIL SPECIFICATION. The Military Specifications and Standards, and indices thereto, prepared and issued by the Department of Defense. Military Specifications may be obtained from Standardization Document Order Desk, 700 Robbins Avenue, Building #4, Section D, Philadelphia, Pennsylvania 19111-5094, Telephone (215) 697-2179.

10-72 PRODUCTS. The materials, systems and equipment to be incorporated into the work.

10-73 PROJECT MANUAL. The bound documents comprising Bidding Requirements, Bid Forms, Contract Forms, General Conditions, Supplementary Conditions, Specifications, Addenda and modifications.

10-74 SAFETY AREA. A designated area abutting the edges of a runway or taxiway intended to reduce the risk of damage to an aircraft that inadvertently leaves the runway or taxiway.

10-75 SUBCONTRACTOR. The pre-qualified (where required) individual, partnership or corporation, or a combination thereof, undertaking the execution of a part of the work under the terms of the contract, by virtue of an agreement with the Contractor approved by the Owner.

10-76 SUBSTANTIAL COMPLETION. The Work (or a specified part thereof) has progressed to the point where, in the opinion of Owner as evidenced by the definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part) can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due in accordance with Section 90. The terms "substantially complete" and "substantially completed" as applied to any Work refer to "Substantial Completion thereof."

10-77 SUPPLEMENTARY CONDITIONS. The part of the Contract Documents which amends or supplements these Standard FAA General Provisions.

SC-3 DELETE "10-65 WORKING DAY".

SECTION 20 PROPOSAL REQUIREMENTS AND CONDITIONS

SC-4 DELETE THIS SECTION IN ITS ENIRETY. REFER TO INSTRUCTIONS TO BIDDERS FOR BID PREPARATION AND SUBMISSION REQUIREMENTS AS WELL AS EVALUATION OF BIDS AND BIDDERS.

SC-5 NOT APPLICABLE.

SC-6 NOT APPLICABLE.

SC-7 NOT APPLICABLE.

SC-8 NOT APPLICABLE.

SECTION 30 AWARD AND EXECUTION OF CONTRACT

SC-9 DELETE THIS SECTION IN ITS ENTIRETY. REFER TO INSTRUCTIONS TO BIDDERS FOR PROCEDURES FOR AWARD AND SIGNING OF CONTRACTS, AND DISPOSITION OF BID SECURITY.

SC-10 PERFORMANCE AND OTHER BONDS:

a. Contractor shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. Contractor shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by the Contract Documents and 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 Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

b. If the Surety on any Bond furnished by Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located, or it ceases to meet the requirements of paragraph a. above, the Contractor shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to Owner.

SECTION 40 SCOPE OF WORK

SC-11 ADD THE FOLLOWING PARAGRAPHS TO THE END OF SUBSECTION 40-02 "ALTERATION OF WORK AND QUANTITIES":

For AIP contracts, supplemental agreements shall be approved by the FAA and shall include valid wage determinations of the U.S. Secretary of Labor when the amount of the supplemental agreement exceeds $2,000. However, if the Contractor elects to waive the limitations on work that increases or decreases the originally awarded contract or any major contract item by more than 25 percent, the supplemental agreement shall be subject to the same U.S. Secretary of Labor wage determination as was included in the originally awarded contract.

All supplemental agreements shall require consent of the Contractor's surety and separate performance and payment bonds.

SC-12 ADD THE FOLLOWING SUBSECTION TO THE END OF SECTION 40 "SCOPE OF WORK":

40-09 ACCESS TO THE WORK. Access to the work will be via the access routes shown on the plans or as directed by the Owner. The Contractor shall identify access routes with suitable signs, barricades and similar equipment.

The entire access route and construction site shall be kept free and clean of all debris at all times and maintained in good repair by the Contractor. All damage to the access route caused by the actions of the Contractor or his agents shall be immediately repaired to the satisfaction of the Owner.

No additional payment will be made to the Contractor for complying with the requirements of this subsection.

SECTION 50 CONTROL OF WORK

SC-13 DELETE SUBSECTION 50-03 "COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS" IN ITS ENTIRETY AND INSERT THE FOLLOWING:

50-03 COORDINATION OF CONTRACT, PLANS, AND SPECIFICATION. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. A

requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In resolving conflicts, discrepancies, or errors in the various contract documents, the documents shall be given the order of precedence, as follows: Contract Form, Supplemental Agreement, Change Order, Addenda, Supplementary Conditions, Plans, Specifications, General Provisions. In case of discrepancy, figured dimensions, unless obviously incorrect, shall govern over scaled dimensions. Cited standards for materials or testing, and cited FAA Advisory Circulars shall be considered as standard specifications.

Any table, gradation, size, dimension, rate, mix, method, nomenclature, pay item number, basis of payment or method of measurement shown on the plans, which is at variance with the standard specifications, shall be considered an amendment or supplement to the applicable specification.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, he shall immediately call upon the Owner for his/her interpretation and decision, and such decision shall be final.

SC-14 DELETE SUBSECTION 50-07 "CONSTRUCTION LAYOUT AND STAKES" IN ITS ENTIRETY AND INSERT THE FOLLOWING:

50-07 CONSTRUCTION LAYOUT AND STAKES. Utilizing the data shown on the plans and/or furnished by the Owner, the Contractor shall establish all horizontal and vertical controls necessary to construct the work in conformance with the plans and specifications. The work shall include performing all calculations required and setting all stakes needed, such as offset stakes, reference point stakes, slope stakes, and other reference marks or points necessary to provide lines and grades for construction.

The Contractor shall employ only competent personnel and utilize only suitable equipment in performing layout work.

He shall not engage the services of any person or persons in the employ of the Owner for performance of layout work.

Adequate field notes and records shall be kept as layout work is accomplished. These field notes and records shall be available for review by the Owner as the work progresses and copies shall be furnished to the Owner at the time of completion of the project. Any inspection or checking of the Contractor's field notes or layout work by the Owner and the acceptance of all or any part thereof, shall not relieve the Contractor of his responsibility to achieve the lines, grades, and dimensions shown in the plans and specifications.

The cost of all stakes and the cost of performing layout work as described above shall be included in the contract unit prices for the various items of work to which it is incidental.

SC-15 NOT APPLICABLE.

SC-16 ADD THE FOLLOWING PARAGRAPHS TO THE END OF SUBSECTION 50-16 "CLAIMS FOR ADJUSTMENT AND DISPUTES":

The following documentation and information must be presented in order for the Owner to properly evaluate such claim:

a. Definition of the basis of the claim, including a detailed identification of which materials and what work is considered to represent a change to the original contract, an explanation of why the work or material is different than what was called for by the original contract, and an identification of the contract provisions and anything else which the Contract relied upon;

b. An explanation of how and why the work, which is considered a change, resulted in any additional cost or performance time for the Contractor;

c. An identification of the categories of additional costs which were incurred, an estimate of the dollar magnitude of each, and a statement of the impact this work will have on the construction schedule, including the contract completion dates;

d. An indication of how the additional costs which is believed that were incurred can be, and are to be, quantified;

e. Documentation of any actual additional costs and any actual impact to the construction schedule due to this work;

f. Documentation of the cost of performing all similar "unchanged" work, to provide the Owner a basis for comparison;

g. All backup and other documentation which are believed to support or relate to the claim;

h. Documentation quantifying the amount of work which is believed to constitute this "changed" work, and the time period and the areas where such work was performed.

SC-17 DELETE SUBSECTION 50-17 "VALUE ENGINEERING COST PROPOSAL" IN ITS ENTIRETY.

SC-18 ADD THE FOLLOWING SUBSECTIONS TO THE END OF SECTION 50 "CONTROL OF WORK":

50-17 RETEST OF WORK. When as provided for in the contract documents, the Owner performs sampling and tests of the work and the tests show a failure to meet the requirements of the contract documents, the expense of retesting, after reworking or substitution by the Contractor will be at the expense of the Contractor and such costs will be deducted from the payments otherwise due to the Contractor.

50-18 CORRECTION OF WORK AFTER FINAL PAYMENT. Neither the final certificate nor payment, nor any provision in the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship and, unless otherwise specified, he shall remedy any defect due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from date of final acceptance. Wherever the word "acceptance" occurs, it shall be understood to mean final acceptance.

The Owner shall give notice of observed defects with reasonable promptness. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after the receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense. With respect to all warranties, expressed or implied, from subcontractors, manufacturer, or suppliers for work performed and materials furnished under this Contract, the Contractor shall:

a. Obtain all warranties that would be given in normal commercial practice;

b. Require all warranties to be executed, in writing, for the benefit of the Owner.

50-19 VENUE. This contract has been executed by, delivered to an accepted by the Owner (or the Authority) in the state where the Airport is located, and the provisions hereof shall be governed by the laws of that state. Any disputes arising out of or related to this contract shall be resolved in accordance with said laws.

The parties agree that any action or legal proceeding arising out of or related to this contract shall be brought in the state courts of the county in which the Airport lies, or in the federal court in the district where the Airport is located; and the parties hereby consent to and waive any objection to jurisdiction or venue in said courts.

SECTION 60 CONTROL OF MATERIALS

SC-19 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 60-02 "SAMPLES, TESTS, AND CITED SPECIFICATIONS":

In the event that any tests show a failure to meet the requirements of the contract documents, the expense of retesting, after substitution or modification by the Contractor, will be at the expense of the Contractor and such costs will be deducted from the payments otherwise due to the Contractor. The Contractor shall give sufficient notification of the placing of orders for materials to permit testing.

SECTION 70 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

SC-20 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 70-01 "LAWS TO BE OBSERVED":

If the Contractor observes that the drawings and specifications are at variance with any laws, codes, ordinances, and regulations, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work contrary to such laws, codes, ordinances, and regulations, and without such notice to the Owner, he shall bear all costs arising therefrom.

SC-21 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 70-05 "FEDERAL AID PARTICIPATION":

The attention of the Contractor is also invited to the fact that the State in which this project is located will pay a portion of the cost of this improvement. In accordance with said State's rules and regulations, work will be subject to such inspection of the State, or its representative, as deemed necessary to protect the interests of the people of the State. The Contractor shall furnish the inspecting party with every reasonable assistance to ascertain whether or not the requirements and intent of the contract are being met. Such inspections will in no way infer that the State is party to the contract, except for those contracts wherein the State is a signatory.

SC-22 ADD THE FOLLOWING PARAGRAPHS TO THE END OF SUBSECTION 70-07 "PUBLIC CONVENIENCE AND SAFETY":

The Contractor shall provide initial and continuing instructions to all supervisors, employees, subcontractors, and suppliers to enable them to conduct their work in a manner that will provide the maximum safety with the least hindrance to air and ground traffic, the general public, airport employees, and to the workmen employed on the site.

All safety provisions specified by the plans and documents or received from the Owner, and those required by laws, codes and ordinances, shall be thoroughly disseminated and rigidly enforced.

SC-23 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 70-08 "CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)":

This work, including required materials and equipment, and labor, etc., shall be incidental to the various items of work and all costs hereto are to be included in the various unit bid items, except as otherwise provided for in the contract documents.

SC-24 DELETE SUBSECTION 70-09 "USE OF EXPLOSIVES" IN ITS ENTIRETY AND INSERT THE FOLLOWING:

70-09 USE OF EXPLOSIVES. Explosives will not be permitted.

SC-25 ADD THE FOLLOWING PARAGRAPHS TO THE END OF SUBSECTION 70-10 "PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE":

Work that is to remain in place which is damaged or defaced by reasons of work performed under this contract, shall be restored at no additional cost to the Owner.

Items removed, intended to be salvaged for Owner or reused in new work, which are damaged beyond repair, shall be replaced with equal new materials under this contract at no additional cost to the Owner.

Existing pavement or other existing work not specified for removal which is temporarily removed, damaged, exposed, or in any way disturbed or altered by work under this contract shall be repaired, patched, or replaced to the complete satisfaction of the Owner at no additional cost to the Owner.

Where it is necessary to cut, alter, remove, or temporarily remove and replace existing property or equipment, the cost shall be included in the contract price for the item creating such work.

It is recognized that the Owner will incur the costs for employees' salaries, and otherwise in connection with the damage and inspection and repair of any such damage, caused by the Contractor; consequently, the Owner may incur loss of income by reason of the diversion of aircraft traffic from the airport resulting from interruption of the use of airport facilities; and that such expenses and loss of income are not measurable now and may not be reasonably ascertainable at the time of any incident caused by the Contractor. The Owner and the Contractor hereby agree to the assessment of liquidated damages in lieu of such expenses or other damages incurred by the Owner. In addition to the obligation of the Contractor to immediately repair any cables or facilities damaged by the Contractor, as set forth above, the sum of not greater than $1,000.00 per incident may be deducted from any money due the Contractor, or if no money is due the Contractor, the Owner shall have the right to recover said sum or sums from the Contractor, from the surety, or from both. The amount of these deductions is to cover liquidated damages to the sponsor incurred by additional and other expenses and damages arising from the incident or incidents caused by the Contractor, and such deductions are not considered as penalties.

SC-26 ADD THE FOLLOWING PARAGRAPHS TO THE END OF THE SUBSECTION 70-19 "ENVIRONMENTAL PROTECTION":

In the event of conflict between Federal, State or local laws, codes, ordinances, rules and regulations concerning pollution control, the most restrictive applicable ones shall apply.

a. The Contractor shall pay special attention to the pollution control requirements of the several specifications. Work items which may cause excessive pollution and shall be closely controlled by the Contractor are:

(1) Clearing, grubbing, burning or other disposal.

(2) Stripping, excavation, and embankment.

(3) Drainage and ditching.

(4) Aggregate production, handling and placing.

(5) Cement, lime, or other stabilization.

(6) Concrete and bituminous materials handling, production, and paving.

(7) Seeding, fertilizing, mulching and use of herbicides or insecticides.

(8) Contractor's own housekeeping items, haul roads, sanitary facilities, water supply, equipment fueling, servicing and cleaning, job clean up, and disposal.

When the Contractor submits his tentative progress schedule in accordance with EXECUTION and PROGRESS, Section 80, he shall also submit for acceptance of the Owner, his schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing, grading, structures at watercourses, construction, and paving, and his proposed method of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Owner.

All bituminous and portland cement concrete proportioning and mixing plants shall meet state requirements.

b. The following stipulations shall apply to this contract unless more restrictive ones are specified by the plans, special provisions, laws, codes, ordinances, etc. Cost of pollution control shall be incidental to the appropriate work items unless otherwise specified.

(1) Control of Water Pollution and Siltation.

(a) All work of water pollution and siltation control is subject to inspection by the local and/or state government enforcing agent.

(b) All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the contract.

(c) Construction operations shall be conducted in such manner as to reduce erosion to the practicable minimum and to prevent damaging siltation of watercourses, streams, lakes or reservoirs. The surface area of erodible land, either on or off the airport site, exposed to the elements by clearing, grubbing or grading operations, including gravel pits, waste or disposal areas and haul roads, at any one time, for this contract, shall be subject to approval of the Owner and the duration of such exposure prior to final trimming and finishing of the areas shall be held to the minimum practical. The Owner shall have full authority to order the suspension of grading and other operations pending adequate and proper performance of trimming, finishing and maintenance work or to restrict the area of erodible land exposed to the elements.

(d) Materials used for permanent erosion control measures shall meet the requirements of the applicable specifications. Gravel or stone, consisting of durable particles, shall be used for construction pads, haul roads and temporary roads in or across streams.

(e) Where called for on the plans, a stilling basin shall be constructed to prevent siltation in the stream from construction operations.

(f) The disturbance of lands and waters that are outside the limits of construction as staked is prohibited, except as found necessary and approved by the Owner.

(g) The Contractor shall conduct his work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemicals, sewage or other harmful materials into streams, rivers, lakes or reservoirs.

(h) Water from aggregate washing or other operations containing sediment shall be treated by filtration, by use of a settling basin or other means to reduce the sediment content to a level acceptable to the local and/or state governmental enforcing agent.

(i) All waterways shall be cleared as soon as practicable of falsework, piling, debris or other obstructions placed during construction operations and not a part of the finished work. Care shall be taken during construction and removal of such barriers to minimize the muddying a stream.

(j) The Contractor shall care for the temporary erosion and siltation control measures during the period that the temporary measures are required and for the permanent erosion control measures until the contract has been completed and accepted. Such care shall consist of the repair of areas damaged by erosion, wind, fire or other causes.

(k) Permanent and temporary erosion control work that is damaged cue to the Contractor's operations or where the work required is attributed to the Contractor's negligence, carelessness, or failure to install permanent controls at the proper time, shall be repaired at the Contractor's expense.

(2) Open Burning of Combustible Wastes

Burning will not be permitted at the airport.

(3) Control of Other Air Pollutants.

(a) Minimum possible areas of open grading, borrow or aggregate excavation shall be exposed at one time, consistent with the progress of the work.

(b) Grading areas shall be kept at proper moisture conditions.

(c) Sand or dust blows shall be temporarily mulched, with or without seeding, or otherwise controlled with stabilizing agents.

(d) Temporary roads, haul routes, traffic or work areas shall be maintained so as to create no dust.

(e) Cements, fertilizers, chemicals, volatiles, etc., shall be stored in proper containers or with proper coverings to prevent accidental discharge into the air.

(f) Aggregate bins, cement bins, and dry material batch trucks shall be properly covered to prevent loss of material to the air.

(g) Drilling, grinding, and sand blasting apparatus shall be equipped with water, chemical, or vacuum dust controlling systems except where otherwise permitted by the Owner in writing.

(h) Applications of chemicals and bitumens shall be held to recommended rates.

(i) Bituminous mixing plants shall be equipped with dust collectors as noted in the specifications.

(j) Quarrying, batching, and mixing operations and the transfer of materials between trucks, bins, or stockpiles shall be properly controlled to minimize dust diffusion.

(k) When necessary, certain operations shall be delayed until proper wind or climatic conditions exist to dissipate or inhibit potential pollutants to the satisfaction of the Owner.

SC-27 DELETE SUBSECTION 70-21 "RESPONSIBILITY FOR DAMAGE CLAIMS" IN ITS ENTIRETY AND INSERT THE FOLLOWING:

70-21 RESPONSIBILITY FOR DAMAGE CLAIMS.

a. INSURANCE:

Contractor shall purchase and maintain such comprehensive general liability, comprehensive automobile liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance and furnishing of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

(1) Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts;

(2) Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

(3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

(4) Claims for damages insured by personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or (b) by any other person for any other reason;

(5) Claims for damages because of injury to or destruction of tangible property wherever located, including loss of use of resulting therefrom;

(6) Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

(7) Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

The insurance required by this paragraph 70-11.1 shall include the specific coverages and be written for no less than the limits of liability and coverages specified in 70-11.3 or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to Owner by certified mail. All such insurance shall

remain in effect until final payment and at all times thereafter when Contractor may be correcting, removing or replacing defective Work in accordance with subsection 50-18. In addition, contractor shall maintain such completed operations insurance for at least two years after final payment and furnish Owner with evidence of continuation of such insurance at final payment and one year thereafter, with the exception of Owner's Protective Liability coverage.

b. INDEMNIFICATION:

(1) The Contractor shall indemnify and hold harmless Owner and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any or them may be liable, regardless of whether or not it is caused by a party indemnified hereunder or arises by or is imposed by Law or Regulations regardless of the negligence of any such party.

(2) In any and all claims against Owner or any of their consultants, agents or employees by any employee of Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 11.2.1 above shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any such Subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

c. COVERAGES:

The limits of liability for the insurance required by Paragraphs 70-11.1 shall provide coverage for not less than the following amounts or greater where required by law:

(1) Workers' Compensation, etc.:

(a)	State:	Statutory
(b)	Applicable Federal (e.g. Longshoreman's)	Statutory
(c)	Employer's Liability	$100,000

(2) Comprehensive General Liability:

(a) Bodily Injury and Property Damage:

$5,000,000 Combined Single Limit (Per Occurrence)

(b) The Contractor's General Liability insurance shall provide coverage for the following: (1) Premises - Operations, (2) Independent Contractors, (3) Products/Completed Operations Hazard, (5) Underground Hazard, (6) Broad Form Property Damage, (7) Where applicable, Explosion and Collapse Hazard, and (8) Personal Injury.

(3) Comprehensive Automobile Liability:

(a) Bodily Injury and Property Damage:

$1,000,000 Combined Single Limit (Per Occurrence)

(b) The Contractor's Comprehensive Automobile Liability Insurance shall provide coverage for Bodily Injury and Property Damage Per Occurrence for owned, hired and non-owned vehicles.

(4) **The Georgia Department of Transportation; Floyd County Board of Commissioners, its officials and staff; and Crawford, Murphy and Tilly, Inc., its staff and consultants shall be named as additional insureds with right of notice in the policy. The Georgia Department of Transportation, Floyd County, and Crawford, Murphy and Tilly, Inc. shall also be named as certificate holders.**

(5) As an alternative to designating the above as additional insureds, the Contractor may, at his option in the name of the Owner, Owner's Protective Liability Insurance which will have the same limits of coverage for the same period as that required above for the Contractor's general liability coverage of $5,000,000 combined single limit, including liability for acts of Subcontractors and Subordinate Contractors.

(6) Contractor shall purchase and maintain such Protective and Contractual Bodily Injury Liability Insurance and such Protective and Contractual Property Damage Liability Insurance as shall be required by any public bodies or utility companies whose property, facilities, or right-of-way may be affected by the Work to be done under this Contract.

(7) Contractor will provide such additional information in respect of insurance provided by him as the Owner may reasonably request. Failure by Owner to give any such notice of objection within the time provided shall constitute an acceptance of such insurance purchased by Contractor as complying with the Contract Documents.

(8) Certificates in triplicate from the insurance carrier stating the limits of liability and expiration date shall be filed with Owner before operations are begun. Certificates shall not merely name the types of policy provided but shall specifically refer to this Contract and shall contain a separate express statement of compliance with each of the requirements as set forth in this subsection. The certificates shall, in addition to the information relative to the insurance required, contain the following:

(a) Inception and expiration dates of insurance policy.

(b) Limits of liability provided (Public Liability and Property Damage).

(c) Coverage provided, including special hazards if required.

(d) Name of insurance company.

(e) Policy Number.

(f) Additional interests covered.

(g) Statement that the Explosion, Collapse, and Underground exclusions do not apply.

(h) Certificate shall reflect self-insured retention applicable to any contract of insurance.

(i) Excess liability certified contracts must state underlying insurance requirements.

(j) Project number and nature of work.

No certificate will be accepted which exculpates the issuer or reduces any rights conferred on the Owner by the above certificates, nor will they be accepted unless the certificates bear a live signature of a direct representative of a company authorized to do business in the state where the work is located.

No certificate will be accepted unless the person signing the certificate certifies, in a separate letter, his exact relationship with the insurance carrier or carriers indicated in the certificate.

The Owner may, at his discretion, modify or waive any of the foregoing requirements.

No contract of insurance containing a "claims made" insuring agreement will be acceptable unless the contractor offering such insurance to fulfill the requirements of this Contract agrees that each such contract of insurance shall be renewed for the entire existence of the Contractor, their successors or assigns; and that on termination of such coverage which is not replaced by a similar contract with the required limits of liability, a "tail policy" will be purchased with limits not less than those required by this Contract."

SC-28 ADD THE FOLLOWING SUBSECTION TO THE END OF SECTION 70 "LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC":

70-22 NO DAMAGES FOR DELAY. In all cases where the Contractor is delayed, obstructed, or hindered in the execution of the work, or any part thereof, for any reason whatsoever, the Contractor shall not be entitled to claim or recover any damages or additional payment from the Owner. However, it is the intent of this Contract that in all cases where the Contractor is substantially delayed, obstructed, or hindered in the execution of the work through no fault of the Contractor and because of conditions beyond the Contractor's control, the Owner may recommend an extension on the contract time under Subsection 80-07 by such amount as conditions, in the judgement of the Owner, justify, and such extension of the contract time shall be the exclusive remedy of the Contractor for delay, hindrance or obstruction occurring through no fault of the Contractor and because of conditions beyond the Contractor's control.

SECTION 80 EXECUTION AND PROGRESS

SC-29 ADD THE FOLLOWING PARAGRAPHS TO THE END OF SUBSECTION 80-05 "CHARACTER OF WORKERS, METHODS, AND EQUIPMENT":

Any person employed by the Contractor or by a subcontractor who, in the opinion of the Owner, does not perform his 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 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 compliance with such orders.

SC-30 DELETE SUBSECTION 80-08 “FAILURE TO COMPLETE ON TIME” IN ITS ENTIRETY AND INSERT THE FOLLOWING:

80-08 FAILURE TO COMPLETE ON TIME. Liquidated damages for failure to complete work within

Contract Time stipulated above will be deducted from money due or to become due the Contractor or his Surety as follows:

1. Failure to complete the entire project within the time specified in Section SC-36 shall result in liquidated damages **in the amount of $1,500.00 per calendar day or portion thereof**. This sum is exclusive of additional engineering fees and inspection fees incurred during the period of delay.

SC-31 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 80-10 "TERMINATION FOR NATIONAL EMERGENCIES":

The Owner shall be given full access to all books, cost records, correspondence and papers of the Contractor relating to the contract in order to determine amounts to be paid the Contractor due to any termination of the contract.

SECTION 90 MEASUREMENT AND PAYMENT

SC-32 DELETE SUBSECTION 90-05 "PAYMENT FOR EXTRA WORK" IN ITS ENTIRETY AND INSERT THE FOLLOWING:

90-05 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK. Extra work, performed in accordance with subsection 40-04 EXTRA WORK, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work. When the change order or supplemental agreement authorizing the extra work requires that it be done by force account, such force account shall be measured and paid for as follows: (THE FOLLOWING PAYMENT PROVISIONS APPLY ONLY WHERE THE NATURE OF THE EXTRA WORK IS SUCH THAT IT CANNOT BE MEASURED AND PAID FOR ACCORDING TO THE CONTRACT UNIT PRICES)

a. Labor. For all labor (skilled and unskilled) and foremen in direct charge of a specific force account item, the Contractor shall receive the rate of wage (or scale) for every hour that such labor or foreman is actually engaged in the specified force account work. Such wage (or scale) shall be agreed upon in writing before the beginning of the work.

The Contractor shall receive the actual costs paid to, or in behalf of, workers by reason of subsistence and travel allowances, health and welfare benefits, pension fund benefits or other benefits, when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed on the work.

An amount equal to 15 percent of the sum of the above items will also be paid to the Contractor.

b. Insurance and Taxes. For property damage, liability, and workmen's compensation insurance premiums, unemployment insurance contributions, and social security taxes on the force account work the Contractor shall receive the actual cost, to which cost (sum) 5 percent will be added. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such insurance and taxes.

c. Materials. For materials accepted by the Owner and then used, the Contractor shall receive the actual cost of such material delivered on the work, including transportation charges paid by him (exclusive of machinery rentals as hereinafter set forth), to which cost (sum) 15 percent will be added.

d. Equipment. For any machinery or special equipment (other than small tools) including fuel and lubricants, plus transportation costs, the use of which has been

authorized by the Owner, the Contractor shall receive the rental rates agreed upon in writing before such work is begun for the actual time that such equipment is committed to the work, to which rental sum 15 percent will be added.

e. Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

f. Comparison of Record. The Contractor and the Owner shall compare records of the cost of force account work at the end of each day. Agreement shall be indicated by signature of the Contractor and the Owner or their duly authorized representatives.

g. Statement. No payment will be made for work performed on a force account basis until the Contractor has furnished the Owner with duplicate itemized statements of the cost of such force account work detailed as follows:

(1) Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.

(2) Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment

(3) Quantities of materials.

(4) Transportation of materials.

(5) Cost of property damage, liability and workman's compensation insurance premiums, unemployment insurance contributions, and social security tax.
Statements shall be accomplished and supported by a receipted invoice for all materials used and transportation charges. However, if material used on the

force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall

furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

The additional payment, based on the percentages specified above, shall constitute full compensation for all items of expense not specifically provided for the force account work. The total payment made as provided above shall constitute full compensation for such work.

SC-33 IN SUBSECTION 90-07 "PAYMENT FOR MATERIALS ON HAND", AFTER PARAGRAPH e., INSERT THE FOLLOWING:

f. The value of the delivered material is to be used in one item of work exceeds $3,000 and is not scheduled to be incorporated into the work within 60 days after delivery.

SC-34 ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION 90-09 "ACCEPTANCE AND FINAL PAYMENT":

Prior to final payment the Contractor shall submit to the Owner a sworn affidavit that all bills for labor, materials, equipment, service, subcontractors and incidentals have been paid and that there are no suits pending in connection with the work done or labor and materials furnished under the contract.

SC-35 ADD THE FOLLOWING SUBSECTION TO THE END OF SECTION 90 "MEASUREMENT AND PAYMENT":

90-12 LIENS. Neither the final payment nor any part of the retained percentage shall become due until the Contractor delivers to the Owner: (a) an affidavit stating, if that be in fact, that all subcontractors and suppliers have been paid in full, or if the fact be otherwise, showing the name of each subcontractor and supplier who has not been paid in full and the amount due or to become due each for labor, service or material furnished; (b) consent of surety, if any, to final payment; and (c) if required by Owner, other data establishing payment for satisfaction of all obligations, such as receipt, releases, and waivers of lien arising out of the Contract to the extent and in such form as designated by the Owner.

SC-36 CONTRACT TIME

Construction for **Taxiway Bravo West Relocation** shall commence within **10** calendar days from the date of receipt of the Notice to Proceed, as evidenced by official receipt of certified mail or acknowledgement of personal delivery and shall be fully completed **within Two Hundred Forty (240) consecutive calendar days** from and including the date of receipt of such notice.

SC-37 COPIES OF CONSTRUCTION DOCUMENTS

OWNER will furnish at no charge to the Contractor two (2) complete sets of plans and specifications for Contractor's use during construction. One set shall be maintained as the Project Record Documents. Additional sets of plans and specifications or individual sheets of plans will be furnished to Contractor at cost of reproduction.

SC-38 NONDISCRIMINATION ASSURANCE (26.7)

The contractor, sub recipient 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. 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 Owner may deem appropriate.

SC-39 PROMPT PAYMENT (26.29)

The prime contractor shall certify in writing that all subcontractors, sub-consultants and suppliers have been paid for work and materials from previous progress payments received, less any retainage, by the prime contractor prior to receipt of any further progress payments. The prime contractor shall include a payment provision in their agreements with their various subcontractors, providing for payment within seven (7) calendar days after the prime contractor’s receipt of payment from the Owner. The prime contractor shall also include a provision in their agreement with various subcontractors providing for payment of retainage to those subcontractors who have submitted an invoice for completed work accepted by the Owner within seven (7) calendar days. This provision in no way creates any contractual relationship between any subcontractor, sub-consultant or supplier and the Airport or any liability on the Owner or the Engineer for the contractor's failure to make timely payment to the subcontractor, sub-consultant or suppliers.

SC-40 CONTRACTOR REPORTING REQUIREMENTS

The Prime Contractor shall submit, with each invoice, a report of DBE expenditures. The report shall show all DBE and non-DBE subcontractors, the amount of their subcontract, the amount earned to date, the amount earned for that respective invoice and the amount remaining to be earned. The report shall also have each DBE subcontractor verify the amounts earned and received by the DBE to date. The contractor’s invoice may be delayed in processing payment or disapproved until the progress report is submitted as required.

PART D
WAGE RATES

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General Decision Number: GA20260068 05/18/2026

State: Georgia

Construction Type: Highway

Counties: Catoosa, Dade, Floyd and Walker

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

SUGA2022-008 07/12/2026

	Rates	Fringes
TRUCK DRIVER: DUMP TRUCK	$ 21.58	3.58
TRAFFIC CONTROL: FLAGGER	$ 14.64	0.00
OPERATOR: ROLLER	$ 18.51	3.99
OPERATOR: PAVER (ASPHALT, AGGREGATE, AND CONCRETE)	$ 23.22	4.10
OPERATOR: LOADER	$ 22.81	1.91
OPERATOR: GRADER/BLADE	$ 26.31	5.43
OPERATOR: CRANE	$ 39.31	0.00
OPERATOR: BULLDOZER	$ 22.82	0.00
OPERATOR: BACKHOE/EXCAVATOR/ TRACKHOE	$ 23.40	3.73
LABORER: PIPELAYER	$ 22.42	0.00
LABORER: COMMON OR GENERAL	$ 20.96	0.00
LABORER: ASPHALT, INCLUDES RAKER, SHOVELER, SPREADER AND DISTRIBUTOR	$ 16.72	2.23
CEMENT MASON/CONCRETE FINISHER	$ 28.44	0.00
CARPENTER	$ 32.68	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of “identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four-letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an abbreviation identifier of the union, which prevailed in the survey for this classification, which in this example would be Plumbers 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2024 is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.
Survey Rate Identifiers

The "SU" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

"SU" wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The "SA" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the "SA" identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) a conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

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END OF GENERAL DECISION

DIVISION 5 – GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General Contract Provisions and other Division 5 and 6 Specification sections, apply to work of this section.

1.02 PROJECT IDENTIFICATION:

A. The Project name is **Taxiway Bravo West Relocation** at the **Richard B. Russell Regional Airport**, as shown on the Contract Documents prepared by Crawford, Murphy & Tilly, Inc. Drawings and Specifications are dated: **June, 2026**.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing site conditions and restrictions on use of the site.
2. Mandatory staging/sequencing.
3. Requirements for partial utilization of various elements prior to substantial completion of the Work.

B. Division 5 - General Requirements of the contract specifications is an integral part of the Contract Documents for each of the Contracts.

1.04 SUMMARY BY REFERENCES:

A. Work of the Contract can be summarized by references to the Contract, General Provisions, Supplementary Conditions, Specification Sections, Drawings, addenda, and modifications to the contract documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

B. Federal Aviation Advisory Circulars. Where work or other requirements are specified by reference to Federal Aviation Advisory Circulars the reference shall be considered to mean the latest change effective on the date bids are received.

1.05 CONSTRUCTION TIME:

A. Time Schedule: The work as described by the contract specifications and as shown on the plans shall be completed and ready for use by the Owner within the awarded number of consecutive calendar days after the date of Notice-to-Proceed. The time schedule for completion of this project is critical due to the impact to aircraft operations. Liquidated damages as prescribed in the Contract will be enforced.

B. Upon approval of the bid and securing the necessary funding by Owner and FAA / GDOT, the Owner will issue a Notice-of-Award.

1.06 COORDINATION:

A. General: Each Contractor is responsible for coordination of his work, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.

END OF SECTION 01010

SECTION 01030

AIRPORT PROJECT PROCEDURES

(Construction Safety Plan)

PART 1: GENERAL

1.01 **INTRODUCTION:** This project will involve Contractor operations within active Air Operations Areas (AOA). The Airport will conduct normal aircraft operations during the course of this project, subject to certain restrictions called out in this section or elsewhere in the specifications. Therefore, to provide for the security and safety of Airport users and the Contractor's forces, as well as to minimize interruptions to aircraft operations, the Contractor shall limit his work within the areas designated and conduct his operations as specified.

1.02 **UNAUTHORIZED CROSSING OF ACTIVE AIRFIELD OPERATIONS AREAS (AOA): Any fines or assessments levied against the Sponsor as a result of intrusions in the AOA or other violations by the Contractor's personnel or those of his subcontractors and material suppliers will be passed on to the Contractor. In addition, the Contractor will be subject to a fine of $1,000.00 per incident, assessed by the Sponsor.**

1.03 **AIR OPERATION AREA (AOA) SAFETY REQUIREMENTS:**

A. Barricades: Existing aprons, taxiways and runways outside the limits of construction shall be separated from construction areas with barricades as shown on the plans and described in Section 01530.

B. Radio Communication: The Contractor shall maintain radio communication with Air Traffic Control (ATC) at all times during construction and shall immediately obey all instructions to vacate areas when directed. Contractor shall have a sufficient number of working radios on site at all times during construction and shall assign responsible personnel to continuously monitor the radio(s).

C. Runway and Taxiway Closures: Closures of runways and taxiways will be made only by the Owner. The Owner shall contact the appropriate FAA Flight Service Station prior to issuing the Notice-to-Proceed so that a Notice-to-Airmen (NOTAM) for runway or taxiway closure can be issued in accordance with established criteria. Construction operations within the runway or taxiway safety zone as defined in paragraph 1.04-B(1) of this section shall not begin until the Contractor receives clearance from the Owner and Engineer assuring that the adjoining runway or taxiway has been closed or that adequate barricades and marking have been provided.

1.04 **CONSTRUCTION SAFETY REQUIREMENTS:**

A. General:

1. Safety Officer: The Contractor is required to employ a Safety Officer who will be the liaison between the Contractor, the Engineer and the Owner in all safety related matters for the duration of the project. The Safety Officer shall be on call 24 hours per day for emergency maintenance of airport hazard lighting, barricades, and other safety features.

2. Protection of Utilities: The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

3. Storage of Equipment, Vehicles, and Materials: All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer.

4. Vehicular Markings: Contractor vehicles and equipment (including sub-contractors, delivery vehicles, etc.) shall be marked with checkered flags and lighted with flashing beacons to comply with requirements of FAA AC 150/5210-5D.

5. Construction Methods Limitation:

   a. **No open flames or burning will be allowed on Airport property.**

   b. Stockpiled material shall be constrained in a manner to prevent displacement by jet blast, prop blast, or wind and shall be kept to a height so as to not penetrate FAR Part 77 imaginary air space.

6. Safety and Accident Protection:

   a. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, and regulations governing safety, health, and sanitation; shall provide barricades; and shall take any other needed actions, on his own responsibility, that are reasonably necessary to protect the life and health of employees on the job, the safety of airport users, and the safety of moving and parked aircraft, and other property during the performance of the work.

   b. The Safety Officer's duties shall include accident prevention.

7. Navigational Aids: Airport navigational aid critical areas are shown on the drawings. The Contractor shall not enter these areas without the Engineer's approval.

8. FAA Advisory Circular: Except as otherwise specified, FAA AC 150/5370-2G and all its references shall be used in maintaining airport operational safety during construction. **A copy of this circular is available on the FAA website.**

B. Runway and Taxiway Safety Zones:

1. Limitations: When necessary to accomplish construction in areas adjacent to runways and taxiways, the construction equipment, vehicles, and men are authorized to operate without interruption within the project limits, except within the following areas and as specified otherwise:

   Distance from Runway centerline
   - within 400 feet.
   Distance from active Taxiway centerline
   - within 93 feet.
   Runway End approach areas
   - within 34:1 slope
   approach surface as shown on drawings, unless noted otherwise.

2. Request for Facility Closures: Construction activities on runways or taxiways or within the above restricted areas shall only be performed at times when the runway or taxiways are closed to aircraft. Closure of a runway or taxiway or any portion thereof must be requested in writing by the Contractor through the Engineer. This request must indicate the areas needed and a schedule of operations and time(s) required for operations within the area. The Owner reserves the right, however, to

shift any approved closure periods to alleviate aircraft congestion or when inclement weather conditions dictate.

3. Equipment Operation Restrictions: Contractor may be permitted to operate trenching machines and other equipment in the runway and taxiway safety zones provided all of the following conditions are satisfied:

   a. The equipment operator and/or crew foreman monitors the ATC ground frequency continuously, using a two-way radio transceiver.

   b. All equipment shall be cleared from the Runway or Taxiway Safety Zones during aircraft operations (landings, take-offs, and taxiing).

   c. All equipment within the Runway and Taxiway Safety Zones is manned and being used. No unnecessary or parked equipment will be allowed within the Runway and Taxiway Safety Zones.

   d. All excavated trenches and holes shall be backfilled, tamped, and leveled to match existing grades before workmen leave the site at the end of each workday.

4. Stockpiles: Stockpiled materials shall not be permitted within the runway or taxiway safety zones. Stockpiles shall be managed to ensure material cannot be displaced by wind, jet blast or propeller wash.

5. Grading Requirements: All construction within a restricted area shall be performed in such a manner that, at the end of the closure period, it will leave the safety area with no abrupt grade changes or grades in excess of 5 percent and with no trenches with depth or width greater than 3 inches, unless in the case of taxiway safety areas, the safety area has been marked and barricaded in accordance with FAA AC 150/5370-2G and as approved by the Engineer.

C. Obstructions to Navigation:

1. Violation of Safety Zone Surfaces: Penetration of equipment, vehicles, materials, or men into the safety zones and approach surfaces requires the preparation and distribution of Notices of Airmen (NOTAM) in advance to the actual penetration.

2. Scheduling: When part of the work in this project is in violation of FAR Part 77, the clearance distance requirements from runway and taxiway edges shall be incorporated into the construction sequence schedule. At no time shall the construction limits of the area under construction violate the safety zones without prior notification to and approval by the Engineer.

3. Coordination and Communication: Work within and adjacent to active AOAs shall be coordinated with the Engineer prior to commencement of the activity. Work crews in these areas shall be accompanied by the construction superintendent and the resident inspector, both of which shall be in constant radio contact with ATC.

D. **Additional safety requirements are set forth in FAA A/C 150/5370-2G, "Operational Safety on Airports During Construction," is available on the FAA website.**

1.05 **SAFETY PLANNING:** The Contractor shall integrate and maintain requirements of airport operational safety into each of his planning and work schedules. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2G; he shall maintain vigilance to detect areas needing attention due to oversight or altered construction

activities. Airport operational safety during construction will be on the agenda at the preconstruction conference and each coordination and progress meeting.

1.06 **SECURITY REQUIREMENTS:** The Contractor has the responsibility for maintaining control of the access gates or any other entrance to the AOA. The Contractor may utilize a gate guard or install an automatic operated gate controller with limited access with numeric keypad. The Contractor's method of maintaining security shall be set forth in his Security Plan. **The Contractor must familiarize himself with and adhere to all Richard B. Russell Regional Airport Security requirements.**

1.07 **BARRICADES:** Contractor shall provide barricades along the active runway and taxiway pavement areas and elsewhere as shown on the plans or as directed by the Engineer while work is proceeding in the taxiway, apron and runway areas. Barricades shall be placed and relocated as necessary during the course of the work to clearly identify areas closed to aircraft operations.

1.08 **RUNWAY AND TAXIWAY CLOSURES:** Runway and / or Taxiway / Taxilane closures shall be scheduled in advance. Contractor shall identify runway and taxiway closures with approved barricades and by covering runway or taxiway lights within closure limits. Remove barricades and covers when no longer needed or as directed by the Engineer.

1.09 **CONTRACTOR USE OF PREMISES:**

A. Use of the Site: Confine operations at the site to the areas designated on the Drawings. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work as stated on this Safety Plan while engaged in project construction.

B. Keep existing drives, entrances and air operations areas designated to remain open, clear and available to the Owner, his employees and the public at all times. Do not use these areas for parking or storage of materials.

C. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain Engineer’s approval.

D. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2: PRODUCTS

2.01 **BARRICADES:** Barricades shall be of material and construction as specified in Section 01530.

PART 3: EXECUTION

3.01 **LIMITATION OF CLOSURES:**

A. Airfield pavement closures will be made only by the OWNER. The Contractor shall request the closure through the OWNER, to issue the order to close an active airfield pavement.

3.02 **BARRICADE INSTALLATION:**

A. Install barricades at location shown on the drawings and where directed by Engineer. Anchor all barricades by approved means. Maintain barricades and markings until removal is directed by Engineer.

B. Barricade batteries shall be checked and maintained on a weekly basis to insure the adequate operation of the flashers during the night. Replace batteries as required. Upon removal of barricades, repair any damage to pavement or surrounding area caused by markers or barricades.

3.03 **PAYMENT:** Except as otherwise specified in Item 01030, no measurement or payment shall be made for this item of work, and it will be considered as an incidental cost to Mobilization, Item C-105.

END OF SECTION 01030

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SECTION 01060

CONTROL OF EROSION, SILTATION AND POLLUTION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

The Contractor shall take whatever measures are necessary to minimize soil erosion and siltation, water pollution and air pollution caused by his operations. The Contractor shall also comply with the applicable regulations of all legally constituted authorities relating to pollution prevention and control. The Contractor shall keep himself fully informed of all such regulations which in any way affect the conduct of the work and shall at all times observe and comply with all such regulations. In the event of conflict between such regulations and the requirements of the specifications, the more restrictive requirements shall apply.

The Engineer will limit the area over which clearing and grubbing, excavation, borrow, and embankment operations are performed whenever the Contractor's operations do not make effective use of construction practices and temporary measures which will minimize erosion, or whenever effective erosion control features are not being completed as soon as permitted by construction operations.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.01 EROSION AND SILTATION CONTROL:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent the eroding of soil and silting of rivers, streams, lakes, reservoirs, other impoundments, ground surfaces, or other property.

Prior to suspension of operations on the project or any portion thereof, the Contractor shall take all necessary measures to protect the construction area from erosion during the period of suspension.

3.02 COORDINATION OF EROSION CONTROL OPERATIONS:

Temporary and permanent erosion control measures shall be provided as shown on the plans or as directed by the Engineer. All permanent erosion control work shall be incorporated into the project at the earliest practicable time. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to assure economical, effective, and continuous erosion control throughout the construction and post construction period and to minimize siltation of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces, or other property.

Temporary erosion control measures shall include but not be limited to the use of temporary berms, dikes, dams, silt fences, drainage ditches, silt basins, diversion ditches, slope drains, structures, vegetation, mulches, mats, netting, gravel, rip rap, or any other methods or devices that are necessary. Temporary erosion control measures may include work outside the construction limits where such work is necessary as a result of construction such as borrow pit operations, haul roads, plant sites, equipment storage sites, and disposal of waste or debris. The Contractor shall be liable for all damages to public or private property caused by silting or slides originating in waste areas furnished by the Contractor.

Materials for temporary erosion control measures shall have been approved by the Engineer before being used or shall be as directed by the Engineer.

Erosion control measures installed by the Contractor shall be acceptably maintained by the Contractor.

3.03 WATER AND AIR POLLUTION:

The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumen's, raw sewage, and other harmful waste shall not be discharged into or alongside of rivers, streams, or impoundments, or into natural or manmade channels leading thereto.

The Contractor shall comply with all Federal, State or local air pollution regulations throughout the life of the project.

3.04 DUST CONTROL:

The Contractor shall control dust throughout the life of the project within the project area and at all other areas affected by the construction of the project, including, but not specifically limited to unpaved roads, haul roads, access roads, disposal sites, borrow and material pits, and production sites. Dust control shall not be considered effective where the amount of dust creates a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property.

The Contractor will not be directly compensated for any dust control measures necessary, as this work will be considered incidental to the work covered by the various contract times.

3.05 APPLICATION OF SPECIFICATIONS:

The provisions of this section shall apply to all construction operations. Further references and detailed requirements concerning erosion, siltation, and pollution prevention and control, may be given in other sections of the specifications and on the drawings.

3.06 CONTRACTOR'S INSPECTION AND REPORT:

The Contractor shall make an inspection of the construction site on a weekly basis and after each potentially damaging rainfall. All possible petroleum leaks and construction exists must be inspected daily. Note shall be taken of any damage to existing erosion control features and of siltation problems encountered during the inspection. In a report to the Engineer, the Contractor shall outline his corrective measures to be undertaken and the date of implementation.

3.07 TEMPORARY SUSPENSION OF WORK:

Failure of the Contractor to fulfill any of the requirements of this section may result in the Engineer ordering the stopping of construction operations in accordance with the following:

A. The Engineer shall have the authority to suspend the work wholly or in part by written order, for such periods as he may deem necessary due to conditions considered unfavorable for the suitable prosecution of the work, or to failure on the part of the Contractor to correct conditions unsafe for workmen or the general public or to carry out orders given or to perform any provisions of the contract. Such suspension of operations will not justify an extension of contract time.

B. Failure on the part of the Contractor to perform the necessary measures to control erosion, siltation, and pollution will result in the Engineer notifying the Contractor to take such measures. Any fine, penalty or other cost assessed by State, local or other governmental agencies for non-performance of erosion, siltation or pollution controls against the Owner shall become the responsibility of the Contractor; such assessments, if not paid by the Contractor, shall be deducted from monies due the Contractor at the completion of the job. In the event that the Contractor fails to perform such measures within 24 hours after receipt

of such notice, the Engineer may suspend the work as provided above, or may proceed to have such measures performed by others. The cost of such work performed by others will be deducted from monies due the Contractor on his contract.

3.08 PAYMENT:

Except where specified otherwise elsewhere in the specifications, there will be no direct payment for any work in connection with the requirements of this section; the work shall be considered incidental to the demolition items.

END OF SECTION 01060

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SECTION 01070

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DESCRIPTION:

A. Abbreviations that may be used in the Contract Documents including the drawings are listed in this section and have the identifications and meanings shown herein except where otherwise indicated.

B. Symbols are identified on the drawings.

C. Related requirements in other parts of the Contract Documents.

1. Drawing symbols: Contract drawings
2. Drawing abbreviations: Contract drawings.

1.02 ABBREVIATIONS:

A. Agencies, Codes, Standards, etc.:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AF	Air Force
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standard Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
COE	Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FS	Federal Specifications
KYTC	Kentucky Transportation Cabinet
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
NWS	National Weather Service
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
UL	Underwriter's Laboratories, Inc.

B. Drawing Abbreviations:

1. The following list is not necessarily all inclusive; additional abbreviations may be used and defined on the drawings.
2. Some abbreviations used on the drawings may not have the same meaning as that identified in the following list; the non-conforming meanings are identified on the drawings when not self-evident.
3. Some variation in use of periods and capitalization may be found on the drawings.

Abbreviations	Meaning	Abbreviations	Meaning
A			
AB	Anchor Bolt	ABT	About
ABV	Above	AC	Advisory Circular (FAA)
AC	Alternating Current	AC	Asphaltic concrete
ACFT	Aircraft	ADDN.	Addition
AF	Air Force	AGG.	Aggregate
AIP	Airport Improvement Program	ALIGN	Alignment
ALP	Airport Layout Plan	ALS	Approach lighting system
ALT	Alternate	ANT.	Antenna
AOA	Air operational area	AP	Airport
APPROX.	Approximate	ARCH.	Architecture
ARP	Airport reference point	ASPH	Asphalt
ATC	Air traffic control	ATCT	Air traffic control tower
AVE	Avenue	AVG	Average
AWG	American wire gage	AWOS	Automatic weather observing systems
B			
B TO B	Back to back	BCN	Beacon
BDY	Boundary	BET.	Between
BF	Both faces	BIT. or BITUM	Bituminous
BLDG	Building	BL	Base line
BM	Bench mark	BOT	Bottom
BRL	Building restriction line	BRK	Brick
BS	Both sides	BTW	Between
BW	Both ways		
C			
C	Centigrade	C TO C	Center to center
CA	Cable	CB	Catch basin
CBM	Construction bench mark	CD	Check dam
CEM	Cement	CFM	Cubic feet per minute
CFS	Cubic feet per second	CHAM	Chamfer
CHG	Change	CHK	Check
CI	Cast iron	CIP	Cast iron pipe
CJ	Construction joint	CL	Clear
C/L	Center line	CLR	Clearance
CMP	Corrugated metal pipe	CO	Cleanout
CONC	Concrete	CONST	Construction
CONT	Continue	CORR	Corrugate
CPP	Corrugated Polyethylene	CPS	Cycles per second
CTB	Cement Treated Base Course	CULV	Culvert
CY. or CU.YD.	Cubic yard		
D			
D	Depth	DAT	Datum

DBL	Double	DBST	Double bituminous surface treatment
DC	Direct current	DEF. ANG.	Deflection angle
DEG	Degree	DEMO.	Demolish
DI	Drop inlet	DIA	Diameter
DIP	Ductile iron pipe	DIM.	Dimension
DIR	Direction	DIST	Distant
DIV	Division	DO	Ditto
DSGN	Design	DTD	Dated
DWG	Drawing		

E

EA	Each	EF	Each face
EG	For example	EJ or EXP JT	Expansion joint
EL or ELEV	Elevation	ENGR	Engineer
EOP	Edge of pavement	EQ	Equal
EQUIP	Equipment	EQUIV	Equivalent
EST	Estimate	EW	Each way
EXC	Excavate	EXIST	Existing
EXT	Exterior		

F

F	Fahrenheit	F TO F	Face to face
FAB	Fabricate	FAR	Federal Aviation Regulation
FBO	Fixed base operator	FDN	Foundation
FF	Finish floor	FG	Finish grade
FH	Fire hydrant	FIG	Figure
FIN	Finish	FLD	Field
FOD	Foreign object damage	FPM	Feet per minute
FPS	Feet per second	FS	Federal Specification
FT	Foot or feet	FTG	Footing
FW	Fresh water	FWD	Forward

G

GA	Gage or Gauge	GAL	Gallon
GALV	Galvanize	GEN	General
GFE	Government-furnished equipment	GOVT	Government
GPM	Gallons per minute	GPS	Gallons per second
GRD	Ground or grade	GV	Gate valve
GVGI	Generic visual	GVGI	Glideslope indicator

H

HP	High point	HGT	Height
HGR	Hangar	HH	Handhole
HIRL	High intensity lighting system	HMAC	Hot mix asphaltic concrete
HOR or HORIZ	Horizontal	HWY	Highway

I

ID	Inside diameter	IDENT	Identification
IFR	Instrument flight rule	ILS	Instrument landing system
IN	Inch	INCL	Include
INT	Intersect	INV	Invert
IP	Inlet protection	IP	Iron pipe

J

JB	Junction Box	JFR	Jet fuel resistant
JMF	Job mix formula	JT	Joint

K			
K	Kip (1,000 lb)	KWY	Keyway
L			
L	Left	LAT	Latitude
LB	Pound	LC	Length of curve
LF	Linear feet	LG	Length or long
LIN	Linear	LITL	Low intensity taxiway lights
LOA	Length over-all	LOC	Localizer
LONG	Longitudinal	LP	Low point
LS	Lump sum	LT	Light
LVC	Length of vertical curve		
M			
MAINT	Maintenance	MALS	Maximum Runway lights Intensity approach
MATL	Material	MAX	Maximum
MH	Handhole	MHW	Mean high water
MIN	Minimum	MIRL	Medium intensity runway lights
MITL	Medium intensity	MISC	Miscellaneous
MLS	Microwave landing system	MLW	Mean low water
MON	Monument	MSL	Mean sea level
MTL	Metal		
N			
NATL	National	NAVAID	Navigational aid
NIC	Not in contract	NO	Number
NOM	Nominal	NOTAM	Notice to airmen
NTS	Not to scale		
O			
OA	Over-all	OC	On center
OD	Outside diameter	OFZ	Obstacle free zone
OPS	Operations	ORIG	Original
P			
PAPI	Precision approach path	PAR	Precision approach radar
PAV'T	Pavement	PC	Point of curve
PCC	Portland cement concrete	PFC	Porous friction course
PI	Point of intersection	PIV	Post indicator valve
PJF	Premolded joint filler	POL	Petroleum fuel, oil, and/or lubricants
PL	Plate	PREP	Prepare
PROJ	Project	PROP	Proposed
PSI	Pounds per square inch	PT	Point
PT	Point of tangency	PVC	Polyvinyl chloride
PVC	Point of vertical curve	PVI	Point of vertical intersection
PVT	Point of taxiway lights vertical tangency	PVMT	Pavement
Q			
QA	Quality assurance	QC	Quality control
R			
R	Right	R or RAD	Radius
RAIL	Runway alignment indicator lights	R/W or RW	Runway
RC	Reinforced concrete	RCP	Reinforced concrete pipe
RD	Road	REF	Reference

REIL	Runway end identifier	REIN	Reinforce
RELOC	Relocated	REP	Repair
REQD	Required	RET	Return
REV	Revise	ROC	Run of crusher
ROW	Right of way	RPM	Revolutions per minute
RPZ	Runway protection zone	RR	Railroad

S

S	Slope	SABC	Stabilized aggregate base course
SALV	Salvage	SAN	Sanitary
SB	Straw bale	SBST	Single bituminous surface treatment
SCHED	Schedule	SEC	Second slope indicator
SEC Cor	Section corner	SECT	Section
SEP	Separate	SF	Silt fence
SF or SQ. FT.	Square feet	SHT	Sheet
SHLD	Shoulder rules	SIM	Similar
SK	Sketch	SP	Space(s)
SPEC	Specification	SQ	Square
SS	Stainless steel	STA	Station
STD	Standard	STL	Steel
STR	Structural fabric	SUPP	Supplement
SWG	Swing	SYM	Symbol
SYM	Symmetrical	SY or SQ.YD.	Square yards between
SYS	System		

T

T	Thick	T	Ton
T&B	Top and bottom	TBM	Temporary bench mark
TECH	Technical	TEL	Telephone
TEMP	Temperature	THK	Thick
THRU	Through	T/L or TL	Taxilane
TOC	Top of curb	TOG	Top of grate
TOL	Tolerance	TOP	Top of pavement
TRANS	Transformer	TSD	Temporary slope drain
T/W or TW	Taxiway	TYP	Typical

U

UD	Underdrain	UG	Underground
UGT	Underground telephone line	USGS	United States Geodetic Survey

V

VASI	Visual approach	VB	Valve box
VC	Vertical curve	VCP	Vitrified clay
VERT	Vertical	VFR	Visual flight
VS	Versus		

W

W	Water	W/	With
WGT	Weight	W/O	Without
WL	Water line	WWF	Welded wire
WP	Working point		

X			
X	By (used dimensions)	XSECT	Cross section
Y			
YD	Yard		

1.03 SYMBOLS:

A. As outlined on drawings.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01070

SECTION 01090

REGULATIONS AND DEFINITIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

Drawings, General Provisions, Specifications, and other contract documents apply to work of this section. See the Contract Provisions for additional definitions.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: This section specifies procedural and administrative requirements for compliance with governing regulations, codes and standards imposed upon the work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

The term "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.

B. Governing Regulations: Refer to General Provisions, Supplementary Conditions, and General Requirements for requirements related to compliance with governing regulations.

1.03 DEFINITIONS:

A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily complete but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.

B. General Requirements: Provisions and requirements of Division 1 sections apply to the entire work of the contract and, where so indicated, to other elements which are included in the project.

C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of locations is intended except as specifically noted.

D. Directed, Requested, etc.: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Engineer", "requested by the Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

E. Approved: Where used in conjunction with the Engineer's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Engineer's responsibilities and duties as specified in General Provisions and Supplementary Conditions. In no case will the Engineer's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work, unless otherwise provided by requirements of the contract documents.

F. Project Site: The term "project site" means the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings.

G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."

I. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

J. Installer: The "installer" is the "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular element of construction at the project site, including installation, erection, application, and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.

1.04 SUBMITTALS:

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with standards and regulations bearing upon performance of the work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01090

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SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION:

A. Method of Measurement and Payment: This section supplements Section 90 of the General Provisions and establishes the method of measurement and payment for work performed under this contract.

B. Unit Price: Except where lump sum is indicated, payment for work performed shall be made on a unit price basis in accordance with the accepted bid and the method of payment provided in the General Provisions.

C. Related Requirements in Other Parts of the Specifications:

1. Bid (Proposal).
2. Agreement.
3. Conditions of the Contract.

D. Related Requirements Specified in Other Sections:

1. Summary of Work - Section 01010.
2. Submittals - Section 01300.
3. Contract Closeout - Section 01700.

E. Work with No Identified Payment Items: No additional payment will be made for items of work for which a separate payment item is not specified or contained in the Bid Schedule; such work shall be deemed incidental to the project and payment for said work shall be considered as included in the various unit bid prices.

1.02 APPLICATIONS FOR PAYMENT:

A. Submittal Schedule: Submit Applications for Payment to the Engineer in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Format and Data Required:

1. Submit Applications for Partial Payment on the form required by the Owner with itemized data typed on 8 1/2 x 11-inch white paper continuation sheets.

2. Provide itemized data on continuation sheet: Format, schedules, line items and values: Those of the Schedule of Values accepted by the Engineer.

C. Preparation of Application for Each Progress Payment:

1. Application Form:

a. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.

b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.

c. Execute certification with the signature of a responsible officer of the contract firm.

2. Continuation Sheets:

a. Fill in total list of all scheduled component items of work, with item number and the scheduled dollar value for each item.

b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar, or as provided in the bid.

3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets.

a. List by Change Order and description, as for an original component item of work.

4. Submit Applications for Payment to Owner at the times stipulated in the Agreement.

a. Number: Four copies of each Application.

D. Substantiating Data:

1. When the Owner or Engineer require substantiating data, Contractor shall submit suitable information with cover letter identifying:

a. Project.
b. Application number and date.
c. Detailed list of enclosures.
d. For stored products: Item number and identification as shown on application.
e. Description of specific material.

2. Submit one copy of data and cover letter for each copy of application.

E. Preparation of Application for Final Payment:

1. Fill in application form as specified for progress payments.

2. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.03 CHANGE ORDER PROCEDURES:

A. Format and Data Required:

1. Change Orders shall be prepared and submitted and will be processed in accordance with requirements of General Provisions and Funding Agency Requirements.

2. Engineer will transmit Certificate for Change to Owner and Agency for approval.

3. When Owner and Agency approval is received, Change Order will be included under next partial Application for Payment.

1.04 MEASURES AND WEIGHTS:

A. Contractor Assistance: To aid the Owner in determining all quantities, the Contractor shall, whenever so requested, provide scales, equipment and assistance for weighing or for measuring any of the materials at no cost to the Owner.

B. Weights and Measures: Quantities for payment will be the actual weight or actual measure, and no special or trade or so-termed customary allowances will be made, nor will any material which is lost or misplaced be included for payment.

C. Use of Planimeter: For estimating quantities in which computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision to the measurement of such areas.

D. Precedence of Dimensions: Figured dimensions on drawings shall take precedence over measurement by scale, and detailed working drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01150

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SUBMITTALS BY CONTRACTOR:

A. Construction Progress Schedule.

B. Safety Plan Compliance Document.

C. Certifications as specified in the various sections.

D. Shop Drawings and Project Data as specified in the various sections.

E. Miscellaneous:

1. Equipment Manuals.
2. Weekly Payroll.
3. EEO Reports.
4. DBE Expenditure Report.
5. Security Plan.
6. Warranties and Bonds.
7. QC Plan.
8. Other(s) as required.

1.02 PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit a CPM type bar-chart schedule 7 calendar days prior to the preconstruction conference date established for the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of work. **Progress Payments may be held if the Contractor fails to provide original and/or updated project schedules for review and approval by the Engineer.**

B. Phasing: Arrange schedule with notations to show how sequence of work is affected by requirements for phased completion, limitations of continued utilization, non-interruptible services, use prior to substantial completion, site restrictions, apron and taxiway closures, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. Phase I schedule is required at the preconstruction meeting. Each subsequent phasing schedule is required at least two weeks before the phase is to begin. Refer to other sections of Division 1 and other contract documents for requirements.

C. Distribution: Following the initial submittal to and response by the Engineer, print and distribute progress schedules to the Engineer (3 copies), Owner, separate contractors, principal subcontractors and suppliers or fabricators, and others with a need-to-know schedule-compliance requirement. Post copies in the project meeting room and temporary field office. When revisions are made, distribute updated issues to the same entities and post

updated issues in the same locations. Delete entities from distribution when they have completed their assigned work and are no longer involved in the performance of scheduled work.

D. Update: Contractor shall update the schedule monthly for duration of construction.

1.03 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

A. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD) to the Engineer for review. Submit the document a minimum of 14 days prior to the pre-construction conference. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.

B. The SPCD shall include a statement by the construction contractor that he/she has read and will abide by the CSPP. The contractor statement should include the name of the contractor, the title of the project CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, and will abide by it as written and with the following additions as noted:").

C. The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

1.04 SHOP DRAWINGS AND PRODUCT DATA:

A. Scope: Submit certifications and product data for all products to be incorporated in the work.

B. Shop Drawings Will:

1. Be original drawings, prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.

2. Be prepared by a qualified detailer.

3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

4. Be sheet size 8 ½ in. X 11 in.

C. Product Data Will:

1. Include manufacturer's standard schematic drawings. The Contractor will:

a. Modify drawings to delete information which is not applicable to project.

b. Supplement standard information to provide additional information applicable to project.

2. Include manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data. The Contractor will:

   a. Clearly mark each copy to identify pertinent materials or products.

   b. Show dimensions and clearances required.

   c. Show performance characteristics and capacities.

D. The Contractor Will:

1. Be responsible for all submittals.

2. Review shop drawings and product data prior to submission.

3. Verify:

   a. Field measurements.

   b. Field construction criteria.

4. Coordinate each submittal with the requirements of the work and of the Contract Documents.

5. Notify the Engineer, in writing at time of submission, of deviations in submittals from requirements of the Contract Documents.

6. Begin no work which requires submittals until the return of submittals with the Engineer's stamp and initials or signature indicating review.

7. After the Engineer's review, distribute copies.

E. Contractor's Responsibilities:

1. Contractor's responsibility for errors and omissions in submittals is not relieved by the Engineer's review of submittals.

2. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittal unless the Engineer gives written acceptance of specific deviations.

F. Submission Requirements Include:

1. The product data and shop drawings shall be submitted in sufficient time to allow discussion and correction prior to beginning the work. Work shall not be performed, nor materials ordered prior to the review of the drawings except at the Contractor's risk.

2. Submit **4** copies of all product data and shop drawings after which one copy will be returned for correction or marked reviewed as noted. Any drawings returned for correction must be resubmitted with same number of copies as required above. Electronic submittal via clear, legible PDF of product data and shop drawings is acceptable.

3. All submittals must be accompanied by a transmittal letter, in duplicate, containing:

    a. Date.

    b. Project title and number.

    c. Contractor's name and address.

    d. The number of each shop drawing and product data submitted.

    e. Notification of deviations from Contract Documents.

    f. Other pertinent data.

4. Submittals shall include the following, as applicable:

    a. Date and revision dates.

    b. Project title and number.

    c. The names of:

        (1) Engineer.

        (2) Contractor.

        (3) Subcontractor.

        (4) Supplier.

        (5) Manufacturer.

        (6) Separate detailer when pertinent.

    d. Identification of product or material.

    e. Relation to adjacent structure or materials.

    f. Field dimensions, clearly identified as such.

    g. Specification item or section number.

    h. Applicable standards, such as ASTM number or Federal Specification.

    i. A blank space, 5 in. x 5 in., for the Engineer's stamp.

    j. Identification of deviations from the Contract Documents.

    k. Contractor's stamp, initialed or signed, certifying Contractor's review of submittal, verification of field measurements, and compliance with Contract Documents.

G. Resubmission Requirements Include:

1. Revision of initial drawings as required, and resubmittal as specified for initial submittal.

2. An indication on the drawings of any changes which have been made, other than those requested by the Engineer.

3. On product data resubmittals, include new data as required for initial submittal.

H. Distribution to Others:

After review and approval, the Contractor will distribute copies of shop drawings and product data which carry the Engineer's stamp to others as may be required.

I. Shop Drawings and Product Data:

1. Submit notarized certifications cosigned by manufacturer/supplier and Contractor for:

a. Pavement sub-base, base, surfacing and related materials.

b. Grass seed.

c. Pavement marking paint.

d. All other products as required by the drawings, specifications, and Engineer.

2. Submit product data for:

a. Concrete and asphalt mix designs.

b. All other products as required by the drawings, specifications, and Engineer.

1.05 MISCELLANEOUS:

A. Weekly Payrolls:

1. In accordance with the General Provisions submit certified weekly payrolls for prime contractor and all subcontractors working at project site.

2. Submit payrolls no later than 7 calendar days after pay period. Payrolls will be considered current if received within 10 calendar days after last workday of payroll work week. A work week is the seven-day period between midnight Sunday and midnight the following Sunday.

3. The Contractor is responsible for submission of payrolls by his subcontractors.

4. Submit a typed summary sheet with each payroll submission listing by week when contractor and each subcontractor worked at site.

5. A payroll submission is only required for weeks when Contractor or subcontractor is actually working at the site.

C. EEO Reports:

1. Contractor shall submit Monthly Employment Utilization Report and Annual EEO-1 Report to the appropriate Federal Labor Area Office in accordance with Section 100 of the General Provisions. Submit copy of submittal to Owner for his records.

2. Prime Contractor shall insure that all his first-tier subcontractors submit these reports and shall submit a sworn statement to Owner monthly certifying that all subcontractor reports have been submitted as required.

D. DBE Expenditure Reports:

With each application for payment, the Contractor shall submit his DBE expenditure report indicating the name, date and amount disbursed to his DBE subcontractors for the period as well as for the project to date expenditure.

E. Security Plan:

At preconstruction conference submit for approval, proposed security plan describing specifically how security will be maintained at each access point and work area by Contractor's forces.

F. Warranties and Bonds:

Submit as specified in Section 01740.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01400

QUALITY CONTROL SERVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings, General Provisions, Supplementary Conditions, Specifications, and other Contract Documents apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS:

A. General: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the Contract Documents.

B. Specified Inspection and Tests: Inspection, tests and related actions specified in this section and elsewhere in the Contract Documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the Contract Documents.

C. Contractor Quality Control: Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this section.

1.03 RESPONSIBILITIES:

A. Contractor Responsibilities: Contractor is responsible for his own quality control testing and inspection to ensure the quality of his means and methods of construction will produce the specified quality of work, and for any tests and inspections required by regulatory agencies. Costs for these services shall be included in the contract sum. The Contractor may employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified, or these services may be performed by qualified contractor personnel.

1. The Contractor shall submit for Engineer's approval a Quality Control (QC) Plan delineating his methods for each item requiring inspections, tests, and similar services.

B. Quality Assurance: The Owner will engage and pay for the services of an independent agency to perform inspections and tests of materials for Quality Assurance.

C. Retest Responsibility: Where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with the requirements of the Contract Documents, then retests are the responsibility of the Contractor, and shall be deducted from monies due the Contractor on his monthly pay request, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.

D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests, and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in

advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:

1. Providing access to the work.
2. Taking samples or providing assistance with taking samples.
3. Delivery of samples to test laboratories.
4. Security and protection of samples and test equipment at the project site.
5. Surveying services required to establish horizontal and vertical location of tests by Engineer's quality assurance testing laboratory.

1.04 SCHEDULE OF SERVICES:

Schedule of Inspections and Tests: Each specification section identifies principal inspections, tests and similar services required by the Contractor Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

General: Upon completion of inspection, testing, sample-taking, and similar services performed on the work, repair damaged work and test sites to eliminate deficiencies. Protect work exposed by or for quality control service activities and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Contractor shall furnish, install, and maintain temporary utilities required for construction and other temporary facilities as indicated; remove on completion of work.

B. Related requirements are specified in other sections of the specifications.

C. **An Engineers Field Office will NOT be required for this project.**

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with National Electric Code.

B. Comply with Federal, State, and Local codes and regulations and with utility company requirements.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL:

Materials, furniture, and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards. Acceptability of all items will be determined by the Engineer.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY AND LIGHTING:

Provide temporary electrical service required for power and lighting and pay all costs for service and for power used.

3.02 TEMPORARY WATER:

A. Provide water for construction purposes; pay all costs for installation, maintenance and removal, and service charges for water used.

B. The site is served by a municipal water system. The Contractor shall make arrangements for securing and providing necessary water as required for the performance of work.

3.03 TEMPORARY SANITARY FACILITIES:

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

3.04 TEMPORARY SUPPORT FACILITIES:

A. General: Provide reasonably neat and uniform in appearance temporary support facilities acceptable to the Engineer and the Owner.

B. Siting: Locate storage and fabrication sheds and other support facilities for easy access to the work.

C. Maintenance: Maintain storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until project completion.

D. Airfield Communications:

1. Contractor shall furnish his construction personnel with sufficient truck and hand-held radios to allow all construction locations to be in radio contact with the Unicom Frequency. A minimum of two (2) hand-held radios will be provided for this purpose. The Contractor shall furnish one (1) additional hand-held radio for use by the Engineer. All radios shall be capable of two-way communications and shall be iCOM IC-A6 VHF Air Band Transceivers or approved equal. When working within active runway or taxiway safety areas, project superintendents shall be in constant radio contact and shall be responsible for controlling the movement of project equipment, vehicles and personnel.

   Provide the following accessories: 114 VAC wall charger, plug-in earphone, car cigarette lighter DC charger, one spare battery, case with belt loop, antenna, and operating manual. Radio shall cover Aviation NAV band 108-118 mH, and COM band 118-136 mH.

2. The radios and accessories will be turned over to the Airport at the conclusion of the work. Replace radios and accessories that are damaged or otherwise inoperable with new items prior to turning over to the Airport.

3. The Contractor will not be directly compensated for providing two-way radios as this work is considered incidental to the work covered by the various contract items.

E. Staging Area: Contractor shall prepare his staging area and access road by grading, drainage, and placing a four (4) inch thick stone base of coarse aggregate (i.e. commonly-used road stone) over the entire staging area and access road(s). The Contractor shall apply a periodic top dressing to the stone base in order to minimize any fugitive dust or mud during the construction period. Upon completion of the project, the stone base shall be completely removed, the site graded to drain, and then topsoiled, seeded, and mulched in accordance with project specifications.

   The Contractor may, at his option, erect fencing around the staging area. Any such fencing shall be removed at the end of the project.

F. Access and Haul Roads:

1. Locations of access and haul roads will be approved by the Engineer and are shown on the drawings. These roads will be located to minimize conflict with Airport operations and shall be maintained, well defined, and confined to the

minimum area required. Damaged roads shall be promptly repaired by the Contractor to the satisfaction of the Engineer at no cost to the Owner.

2. The Contractor shall utilize existing access and haul roads and shall maintain the roads as required to create no dust. All project traffic must be routed through these areas. The Contractor shall provide all markings required to clearly define the access and haul roads.

3. The Contractor will be responsible for obtaining any necessary driveway permit(s) from local or state agencies for access and haul roads.

4. If access or haul roads cross a utility, the Contractor shall protect the utility as directed by the Owner of the utility.

5. There shall be no direct payment for the construction, maintenance, and removal of access and haul roads.

3.05 EXECUTION, GENERAL:

Maintain and operate systems to assure continuous service.

3.06 REMOVAL:

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore grassed and paved areas to their pre-construction condition.

3.07 MEASUREMENT AND PAYMENT:

There shall be no separate measurement and payment for Temporary Facilities. All provision and maintenance costs shall be included in the various items of associated work.

END OF SECTION 01510

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SECTION 01530

AIRFIELD BARRICADES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Provide temporary barricades and runway closure markers as required for safety of aircraft and contractor's workforces, and to maintain use of the various portions of the air operations area during construction.

B. Comply with the referenced FAA Advisory Circulars and the safety and staging plan.

C. Related work specified elsewhere:

1. Construction safety: General Provisions and General Requirements.

2. Staging and safety plan: Contract Drawings and General Requirements.

PART 2 PRODUCTS

2.01 BARRICADES:

A. Provide barricades, lights and flags which are compliant with FAA AC 150/5370-2 (Latest Edition). Provide flashing or steady burning red lights and 20-inch by 20-inch orange flags.

2.02 LIGHTED RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Lighted Runway Closure Markers for this project shall be provided by the Airport for the Contractor's use throughout the duration of the project. All work associated with transporting, positioning, operating, maintenance, fueling and any repairs of the Runway Closure Markers shall be the responsibility of the Contractor. At the end of the project, the lighted runway closure markers will be returned to the Airport in good working order for their possession and use.

2.03 FABRIC RUNWAY CLOSURE MARKERS ("X" UNITS):

Two (2) Fabric Runway Closure Markers for this project shall be provided by the Contractor for the Contractor's use throughout the duration of the project. All costs associated with the Fabric Runway Closure Markers shall be the responsibility of the Contractor and shall be included in the Cost of Mobilization. ~~At the end of the project, the Two (2) Fabric Runway Closure Markers will be turned over to the Airport for their permanent possession and use.~~

PART 3 EXECUTION

3.01 GENERAL:

A. Install barricades at locations shown on the drawings and where directed by Engineer. Generally, place barricades a maximum of 10 feet apart. The barricades shall be placed in a continuous line on the apron taxilane and taxiway as shown on the phasing plan drawing and as directed by the Engineer. Anchor barricades with sandbags or other methods approved by Engineer.

B. Install Lighted or Fabric "Runway Closure Markers at runway numerals at each end of the runway prior to the start of operations which require closures. Fabric or Lighted Runway Closure Markers will be removed or relocated by the Contractor to the Contractor's staging and storage area, to the Owner's storage facility, or as directed by the Engineer prior to opening the runway.

C. Maintain barricades until removal is directed by Engineer. The barricade flasher batteries shall be checked daily to ensure that flashers are operational. **Contractor shall replace barricade batteries, replace light fixtures, replace 20" x 20" orange flags, and replace orange and white reflective bands as required by the Engineer and the Owner.**

D. Remove barricades and Fabric or Lighted Runway Closure Markers as directed by Engineer. Repair any damage to pavement or surrounding area caused by barricades and Fabric or Lighted Runway Closure Markers. Turn over all barricades to the airport at the conclusion of the work. Replace any barricade, barricade flags and barricade flashers that are damaged or inoperable.

3.02 MEASUREMENT AND PAYMENT:

Barricades and Fabric or Lighted Runway Closure Markers shall not be measured for payment. The cost associated with these items shall be included in the cost of Mobilization and shall include all labor, materials, maintenance, batteries, and fuel for Lighted Runway Closure Markers; and removal, installing, hauling, and storing as many times as needed, barricades and Fabric or Lighted Runway Closure Markers required for the Contractor's Approved Phasing Plan.

END OF SECTION 01530

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL:

A. Material and Equipment (Products) Incorporated into the Work:

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.

3. Shall not be used for any purpose other than that for which it is designed or is specified.

4. Develop a Hazardous Materials (HAZMAT) Management Plan if Hazardous Materials will be utilized. Submit the Plan to the Engineer for review and approval.

5. Maintain copies of all material safety data sheets (MSDS) on the jobsite for all materials used during the work.

B. Related Requirements in Other Parts of the Project Manual:

1. Conditions of the Contract.

1.02 PRODUCTS SUBSTITUTIONS AND OPTIONS:

A. Products List:

1. Contractor shall submit a complete list of products to be incorporated into the work (with the name of the installing contractor) at the Preconstruction Conference required by these specifications.

B. Contractor's Options:

1. For products specified only by reference standard, select any product meeting that standard.

2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.

C. Product Substitutions:

1. Contractor shall submit, at the Preconstruction Conference, all requests for product substitutions. No requests for substitutions will be accepted from manufacturers or suppliers.

2. Submit a separate written request for each product, supported with complete data, with drawings and samples as appropriate, including:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the product specified.

e. Any required license fees or royalties.

f. Availability of maintenance service and source of replacement materials.

3. Engineer shall be the judge of the equality and acceptability of the proposed substitution.

4. If Engineer determines the proposed substitute product is not "equal" to the specified product, the Contractor must provide the specified product, subject to Engineer's shop drawing review and approval.

5. No further requests for substitutions will be considered after Preconstruction Conference.

D. Contractor's Representation: A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.

2. Will provide the same warranties or bonds for the substitution as for the product specified.

3. Will coordinate the installation of an accepted substitution into the work and make such other changes as may be required to make the work complete in all respects.

4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

E. Engineer's Review: Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

1.03 MANUFACTURER'S INSTRUCTIONS:

A. Printed Instructions: When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including copies to Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Strict Compliance: Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instruction, consult with Engineer for further instructions.

2. Do not proceed with work without clear instructions.

C. Complete Compliance: Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.04 TRANSPORTATION AND HANDLING:

A. Deliveries: Contractor shall arrange deliveries of products in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and those products are properly protected and undamaged.

3. Ensure that material or products arriving to or departing from the project site and Airport is secure and / or covered during transport and loaded in a manner which ensures no spillage occurs during transit.

B. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage of products or packaging.

1.05 STORAGE AND PROTECTION:

A. Storage: Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosures.

2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage:

1. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Storage Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection After Installations: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL:

A. Comply with requirements stated in conditions of the contract and in specifications for administrative procedures in closing out the work.

B. Related requirements in other parts of the Project Manual:
1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the contract.

C. Related Requirements Specified in Other Sections.
1. Closeout submittals required of trades: The respective sections of specifications.

1.02 SUBSTANTIAL COMPLETION:

A. The conditions and procedures for inspection; and Contractor's and Owner's responsibilities pertaining to Substantial Completion are as specified in Section 50 of the General Conditions.

1.03 FINAL INSPECTION:

A. Shall be in accordance with conditions and procedures outlined in the General Provisions.

B. When Owner finds that the work is acceptable under the Contract Documents, he will request required Contractor's Closeout Submittals.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER:

A. Evidence of payment and release of liens: To requirements of General and Supplementary Conditions.

B. Certificates of Insurance for products and completed operations.

C. Warranties and Bonds: To requirements of Section 01740.

D. Evidence of compliance with requirements of governing authorities:
1. Certificates of Inspection.

E. Project Record Documents: to requirements of Section 01720.

F. DBE Accomplishment Report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01700

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SECTION 01710

CLEANING AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION:

Contractor shall execute cleaning during progress of the work and at completion of the work, as required by the General Provisions and other specification documents.

1.02 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, and with airport and construction safety requirements.

B. All disposal of waste materials shall be off airport property at locations approved by the Engineer.

C. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

1.03 SUBMITTALS:

A. Prior to beginning work, submit a Disposal Plan for the satisfactory disposal of all waste materials and debris.

B. Submit two (2) copies of the disposal site owner's written permission for such disposal with Disposal Plan.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 CLEANING:

A. Execute periodic cleaning to keep the work, site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Provide a functional pick-up sweeper on site for the collection of debris resulting from the contractor's work activities to facilitate timely opening of the runway.

D. Remove waste materials, debris, and rubbish from the site periodically and dispose of at approved locations.

3.02 BARRIERS AND PROTECTION:

Protect existing structures and vegetation from cleaning and disposal operations as required.

3.03 DUST CONTROL:

A. Schedule cleaning and other operations so that dust and other contaminants resulting therefrom will not fall on wet or newly coated surfaces, will not damage or contaminate aircraft, and will not unduly affect the work of other airport tenants.

3.04 DISPOSAL OF DEBRIS AND WASTE MATERIALS:

A. All waste materials shall be removed from site and disposed of in accordance with the Disposal Plan. **No on-site burning will be permitted.**

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall maintain at the site as specified herein for the Owner one (1) record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. Laboratory test records.

B. Related requirements in other parts of the Project Manual:

1. Conditions of the Contract.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES:

A. Store record documents and samples in Contractor's field office apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by Engineer.

3.02 RECORDING:

A. Stamp or label each document "PROJECT RECORDS" in 3/4-inch letters.

B. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction in color codes designated by the Engineer.

D. Record Information includes but is not limited to the following:

1. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.
2. Field changes of dimension and detail.
3. Changes made by field order or by change order.
4. Details not on original contract drawings.
5. Extent and dimensions of pavement removal.
6. Any other changes in the plans.

E. Set one (1) Concrete Benchmark and document location and elevation data.

F. Specifications and addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product actually installed.
2. Changes made by field order or by change order.

G. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

3.03 SUBMITTAL:

A. **At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one (1) complete set of Record Documents.**

B. Accompany submittal with transmittal letter containing:

1. Date.
2. Project title and number.
3. Contractor's name and address
4. Title and number of each record document.
5. Signature of Contractor or his authorized representative.

3.04 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01720

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS:

A. Contractor shall:
1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals to verify compliance with Contract Documents.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related requirements in other parts of the Project Manual:
1. Bid Bonds: Instructions to bidders.
2. Performance Bond and Payment Bond: Conditions of the contract.
3. General warranty of construction: Conditions of the contract.

C. Related requirements specified in other sections:
1. Contract closeout: Section 01700
2. Equipment Manuals: Section 01300
3. Warranties and Bonds required for specific products: Each respective section of specifications.
4. Provisions of Warranties and Bonds, duration: The respective section of specifications which specifies the product.

PART 2 PRODUCTS (Not Used.)

PART 3 EXECUTION

3.01 SUBMITTAL REQUIREMENTS:

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product or work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.
6. Provide information for Owner's personnel:
   a. Proper procedure in case of failure.
   b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address, and telephone number.

3.02 FORM OF SUBMITTALS:

A. Prepare in duplicate packets.

B. Format:
1. Size 8 1/2 inches x 11 inches, punch sheets for 3-ring binder.
   a. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
   a. Project title and number
   b. Owner's name.
   c. Contractor's name and address.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

3.03 TIME OF SUBMITTALS:

A. Submit within ten (10) days after date of substantial completion, and prior to final request for payment.

B. For items of work where acceptance is delayed materially beyond the date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

3.04 SUBMITTALS REQUIRED:

Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of specifications.

3.05 PAYMENT:

No separate payment will be made under this section for work described or specified herein.

END OF SECTION 01740

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) 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.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with

respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

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

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time on-site employee of the Contractor, or a consultant engaged by the Contractor. The

CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

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

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

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

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

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

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

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

8.1.3 Equipment Calibration and Checks;

8.1.9 Equipment Calibration, Standardization, and Check Records;

8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

7 Test Methods and Procedures

8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

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

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

b. Item description (e.g., Hot Mix Asphalt Pavements)

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

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

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

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

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

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

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

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

a. Daily inspection reports. Each Contractor QC technician 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 QC 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) Summary of any necessary corrective actions
(7) Safety inspection.
(8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests 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 QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description
(2) Test designation
(3) Location
(4) Date of test
(5) Control requirements
(6) Test results
(7) Causes for rejection
(8) Recommended remedial actions
(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

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

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

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.

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 20%.

d. When 75% or more of the original contract is earned, an additional 20%

e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100-14.01 Contractor Quality Control Program (CQCP) - per lump sum

REFERENCES

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

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
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

END OF ITEM C-100

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Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901 shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing

operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 Temporary erosion and pollution control work required will be performed as scheduled or directed by the RPR. Completed and accepted work will be measured as follows:

a. Temporary seeding and mulching will be measured by the acre

b. ~~Temporary slope drains will be measured by the linear foot (meter).~~

c. ~~Temporary benches, dikes, dams, and sediment basins will be measured by the cubic yard (cubic meter) of excavation performed, including necessary cleaning of sediment basins, and the cubic yard (cubic meter) of embankment placed as directed by the RPR.~~

d. ~~All fertilizing will be measured by the ton (kg).~~

e. Installation, maintenance and removal of silt fence will be measured by the linear foot sum.

102-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-5.01	Temporary seeding and mulching - per acre
Item C-102-5.02	Installation and removal of silt fence - per linear feet
Item C-102-5.03	Maintenance of Silt Fence – per linear feet

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with Section 90, paragraph 90-05 *Payment for Extra Work*.

REFERENCES

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

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

Item C-105 Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must 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.

105-4 Engineer/RPR field office. ~~The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.~~

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. 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 as required by Section 90, paragraph 90-11, *Contractor Final Project Documentation,* the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105-6.01 Mobilization – per lump sum

REFERENCES

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

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

Item C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (Sn) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, QL for Lower Quality Index and/or QU for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

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

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.

b. Locate the random sampling position within the sublot in accordance with the requirements of the specification.

c. Make a measurement at each location or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.

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

$$X = (x1 + x2 + x3 + \ldots xn) / n$$

Where: X = Sample average of all sublot test values within a lot

x1, x2, . . .xn = Individual sublot test values

n = Number of sublot test values

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

$$Sn = [(d12 + d22 + d32 + \ldots dn2)/(n-1)]1/2$$

Where: Sn = Sample standard deviation of the number of sublot test values in the set

d1, d2, . . .dn = Deviations of the individual sublot test values x1, x2, … from the average value X

that is: d1 = (x1 - X), d2 = (x2 - X) … dn = (xn - X)

n = Number of sublot test values

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

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

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with QL, using the column appropriate to the total number (n) of measurements. If the value of QL falls between values shown on the table, use the next higher value of PWL.

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

$$QL = (X - L) / Sn$$
and
$$QU = (U - X) / Sn$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with QL and QU, using the column appropriate to the total number (n) of measurements, and determining the percent of material above PL and percent of material below PU for each tolerance limit. If the values of QL fall between values shown on the table, use the next higher value of PL or PU. Determine the PWL by use of the following formula:

$$PWL = (PU + PL) - 100$$

Where: PL = percent within lower specification limit
PU = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project
Test Item: Item P-401, Lot A.
A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

   A-1 = 96.60
   A-2 = 97.55
   A-3 = 99.30
   A-4 = 98.35
   n = 4

2. Calculate average density for the lot.

   X = (x1 + x2 + x3 + . . .xn) / n
   X = (96.60 + 97.55 + 99.30 + 98.35) / 4
   X = 97.95% density

3. Calculate the standard deviation for the lot.

Sn = [((96.60 - 97.95)2 + (97.55 - 97.95)2 +(99.30 -97.95)2 + (98.35 -97.95)2)) / (4 - 1)]1/2

Sn = [(1.82 + 0.16 + 1.82 + 0.16) / 3]1/2

Sn = 1.15

4. Calculate the Lower Quality Index QL for the lot. (L=96.3)

QL = (X -L) / Sn

QL = (97.95 - 96.30) / 1.15

QL = 1.4348

5. Determine PWL by entering Table 1 with QL= 1.44 and n= 4.

PWL = 98

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

A-1 = 5.00

A-2 = 3.74

A-3 = 2.30

A-4 = 3.25

2. Calculate the average air voids for the lot.

X = (x1 + x2 + x3 . . .n) / n

X = (5.00 + 3.74 + 2.30 + 3.25) / 4

X = 3.57%

3. Calculate the standard deviation Sn for the lot.

Sn = [((3.57 - 5.00)2 + (3.57 - 3.74)2 + (3.57 - 2.30)2 + (3.57 -3.25)2) / (4 - 1)]1/2

Sn = [(2.04 + 0.03 + 1.62 + 0.10) / 3]1/2

Sn = 1.12

4. Calculate the Lower Quality Index QL for the lot. (L= 2.0)

QL = (X - L) / Sn

QL = (3.57 - 2.00) / 1.12

QL = 1.3992

5. Determine PL by entering Table 1 with QL = 1.41 and n = 4.

PL = 97

6. Calculate the Upper Quality Index QU for the lot. (U= 5.0)

QU = (U - X) / Sn

QU = (5.00 - 3.57) / 1.12

QU = 1.2702

7. Determine PU by entering Table 1 with QU = 1.29 and n = 4.

PU = 93

8. Calculate Air Voids PWL

PWL = (PL + PU) - 100
PWL = (97 + 93) - 100 = 90

Example of Outlier Calculation (Reference ASTM E178)

Project: Example Project
Test Item: Item P-401, Lot A.
A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

   A-3 = 99.30

   A-4 = 98.35

   A-2 = 97.55

   A-1 = 96.60

2. From ASTM E178, Table 1, for n=4 an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

   a. For measurements greater than the average:

      If (measurement - average)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

      For A-3, check if (99.30 - 97.95) / 1.15 is greater than 1.463.

      Since 1.174 is less than 1.463, the value is not an outlier.

   b. For measurements less than the average:

      If (average - measurement)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

      For A-1, check if (97.95 - 96.60) / 1.15 is greater than 1.463.

      Since 1.435 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

Greater than (97.95 + 1.463 × 1.15) = 99.63%

OR

less than (97.95 - 1.463 × 1.15) = 96.27%.

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

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

REFERENCES

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

ASTM International (ASTM)

ASTM E178 Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

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ITEM D-699

MAINTENANCE OF PERMANENT PONDS AND TEMPORARY SEDIMENT BASINS

DESCRIPTION

699-1.1 This item consists of the materials and items for work necessary to maintain permanent ponds and temporary sediment basins as indicated on the plans and to restore to a stabilized condition with positive drainage and no remaining sediment or muck. This item also includes maintaining plugs and pumping water from sediment basins and ponds, which are plugged for erosion control.

MATERIALS

699-2.1 RETROFITTING: Ponds and temporary sediment basins contain existing retrofitting to be maintained. See Item D-700 for details on Retrofitting.

699-2.2 GRASSING AND MULCHING: Temporary and permanent grassing for maintenance of permanent ponds and temporary sediment basins shall be in accordance with Item T-901.

699-2.3 EROSION CONTROL MATTING: See Item E-895 for details.

699-2.4 PUMPS: Any pumps used in conjunction with pumping water to use on-site shall have minimum rate of 400 gpm.

MAINTENANCE

699-3.1 MAINTENANCE: Prior to beginning work, the contractor shall field verify the original geometry and elevations of each permanent pond and temporary sediment basin and shall verify the elevation of the cleanout post and reinstall if necessary.

Permanent ponds and temporary sediment basins shall be inspected after each significant rainfall event. Sediment accumulations shall be removed when the cleanout elevation shown on the plans is reached or when directed by the Field Engineer, and the pool area restored to its original line and grade.

When retrofitting becomes clogged with sediment or as directed by the Engineer, the contractor is required to remove and replace the filter stone. While the CMP half-round does not have to be replaced when the pond is maintained, if the CMP is damaged then the Contractor will also be required to replace the CMP as part of the pond and temporary sediment basin maintenance.

Slopes, spillways and outlets shall be inspected periodically for damage, and repairs promptly made when needed. All trash and other debris shall be immediately removed from the pool area.

699-3.2 PUMPING: If NTU values cannot be reached with Erosion Control Measures as shown on the plans, at the direction of the Engineer of Record, ponds shall be plugged to

retain water and shall be pumped after each rainfall event. Permanent ponds and temporary sediment basins shall be pumped when the water reaches the cleanout elevation or as directed by the Engineer. Water pumped from ponds shall be used on-site by the Contractor or pumped off-site in accordance with the specifications and as approved by the engineer. Any water pumped off site shall be tested for NTU values < 100 NTU and shall be approved by the engineer. All water pumped off-site shall be pumped through the Dirt Bags and shall not be pumped directly into the streams, but a minimum of 25ft from the edge of the stream to allow water to flow through stream buffer prior to entering stream. The Contractor shall provide any silt fence or other erosion control measures around these Dirt Bags as directed by the Engineer. The cost of these erosion control measures shall be considered incidental to the cost of the Dirt Bags. Contractor shall make necessary arrangements to pump water from ponds prior to the next rainfall event as directed by engineer. If pond is not pumped prior to rainfall, Engineer reserves the right to cease all land disturbing operations until pond is pumped. Any sediment accumulation resulting downstream and associated fines resulting from the pond not being pumped as directed by Engineer shall be the responsibility of the Contractor.

699-3.2 STABILIZING PERMANENT PONDS AND TEMPORARY SEDIMENT BASINS: When all land disturbing activities are complete and as directed by the Engineer, all Permanent Ponds and Temporary Sediment Basins shall be de-mucked, re-graded to drain properly to the existing outlet control structure, stabilized with permanent matting and grassing, and the existing retrofitting shall be removed and disposed of by the Contractor off-site. Any de-mucking and re-grading shall be done in accordance with the specification for Item P-152 – Excavation and Embankment. A representative of the contractor and the Engineer shall inspect the ponds and basins before final acceptance.

METHOD OF MEASUREMENT

699-4.1 The quantity for the maintenance of permanent ponds and temporary sediment basins shall be per each per pond or basin for all the work items specified throughout the duration of the Project.

699-4.2 The quantity for pumping of permanent ponds and temporary sediment basins shall be per day for all ponds and for all sediment basins on the Project.

BASIS OF PAYMENT

699-5.1 For "Construction of Temporary Sediment Pond", payment shall be made at the contract price per each per pond or basin. The contract price per each shall include the construction of permanent ponds and temporary sediment basins from the beginning of the project to the final acceptance of the project. No separate payment will be made for multiple maintenance, rehandling, spreading, placement of topsoil, grassing, erosion control matting, maintaining or removing retrofitting, excavation or embankment required for re-grading, or surveying. Construction of each permanent pond and temporary sediment basin will only be paid once. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item, including final stabilization.

699-5.2 For "Maintenance of Permanent Pond" and "Maintenance of Temporary Sediment Pond", payment shall be made at the contract price per each per pond or basin. The contract price per each shall include the maintenance of permanent ponds and temporary sediment basins from the beginning of the project to the final acceptance of the project. No separate payment will be made for multiple maintenance, rehandling, spreading, placement of topsoil, grassing, erosion control matting, maintaining or removing retrofitting, excavation or embankment required for re-grading, or surveying. Maintenance of each permanent pond and temporary sediment basin will only be paid once. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item, including final stabilization.

699-5.3 ~~For "Pumping of Permanent Ponds" and "Pumping of Temporary Sediment Basins ", payment shall be made at the contract price per day. The contract price per each day shall include all labor, equipment, materials, and pumps. Any polymers applied to the ponds or sediment basins to meet the required NTU value shall not be measured separately but shall be included in the cost of pumping. The cost of pumping shall be paid per day for each sediment basin or pond only on the days that pumping is required.~~

699-5.4 For "Cleanup and Final Stabilization of Pond", payment shall be made at the contract price per each per pond or basin. The contract price per each shall include the maintenance of permanent ponds and temporary sediment basins from the beginning of the project to the final acceptance of the project. No separate payment will be made for multiple maintenance, rehandling, spreading, placement of topsoil, grassing, erosion control matting, maintaining or removing retrofitting, excavation or embankment required for re-grading, or surveying. Cleanup of each permanent pond and temporary sediment basin will only be paid once. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item, including final stabilization.

Payment will be made under:

Item D-699-5.01	Construction of Temporary Sediment Pond – per Each
Item D-699-5.02	Maintenance of Temporary Sediment Pond - per Each.
Item D-699-5.03	Cleanup & Final Stabilization of Pond – per Each

END OF ITEM D-699

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ITEM D-700

PERMANENT POND AND TEMPORARY SEDIMENT BASIN APPURTENANCES

DESCRIPTION

700-1.1 This item shall consist of the specifications for appurtenances to all permanent ponds and temporary sediment basins which includes perforated CMP, filter fabric, sediment clean out indicator post and filter stone as shown in the plan drawings.

MATERIALS AND EXECUTION

700-2.1 ANTI-SEEP COLLARS: After placement of RCP pipe through the pond or basin embankment, concrete anti-seep collars shall be installed to the pipe as indicated in the drawings. Excavations shall be made at the appropriate locations in the pipe trench to allow placement of the collars. Excavation around the collars shall be backfilled in accordance with Item P-152.

700-2.2 PERFORATED CMP: The perforated CMP shall be installed as indicated on the drawings and shall meet the material requirements set forth in the Manual for Sediment and Erosion Control in Georgia (Latest Version).

700-2.3 FILTER STONE: The number 57 filter stone shall be installed as indicated on the drawings. Stone shall meet the requirements of D-753.

700-2.4 FILTER FABRIC: The filter fabric shall be installed as indicated on the drawings. The filter fabric shall meet the requirements as specified under specification D-753.

700-2.5 ~~SKIMMERS: The skimmer shall be installed as indicated on the drawings and per manufacturer's recommendations. The skimmer shall meet the requirements as shown on the plans.~~

CONSTRUCTION METHODS

700-3.1 EQUIPMENT: All equipment necessary and required for the proper construction of the Permanent Pond and Temporary Sediment Basin Retrofittings shall be on the project, in working condition and approved by the Engineer before land disturbing activities are permitted to start, with the exception of building the permanent ponds and sediment basins.

The Contractor shall provide appropriate hoisting equipment to handle the materials while unloading and placing it in its final position without damage to the discharge pipe and structure through the pond and/or basin embankment.

The Contractor shall provide appropriate hand tampers and pneumatic tampers to obtain the required compaction around the structure and anti-seep collars as specified.

Movement of construction machinery over a discharge culvert through the pond and/or basin embankment shall be at the Contractor's risk. Any pipe damaged thereby shall be replaced at the expense of the Contractor.

700-3.2 RESTORATION AND INSPECTION:

A. Cleaning and Restoration of Site - After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankment, shoulders, or as ordered by the Engineer. The Contractor shall restore all disturbed areas to their original condition.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear, and in good condition.

Performance of the work described in this section is not payable directly but shall be considered as a subsidiary obligation of the Contractor covered under the contract unit price for the permanent pond and temporary sediment basin appurtenances.

B. Inspection - Prior to final approval of the permanent pond and temporary sediment basin retrofitting, the Engineer, accompanied by the Contractor's representative, shall make a thorough inspection, by an appropriate method, of the entire installation. Any indication of defects in material or workmanship, or obstruction to flow in the pipe system, shall be further investigated and corrected. Defects due to the Contractor's negligence shall be corrected by the Contractor without additional compensation and as directed by the Engineer.

C. Maintenance – Maintenance of the retrofitting shall be as stated in the plans and as set forth in Item D-699.

MEASUREMENT AND PAYMENT

700-4.1 The payment for the following items shall constitute full compensation for all preparation, shop drawings, materials, labor, equipment, installation, tools, shoring, cleaning, restoration and other incidentals necessary to satisfactorily complete each item of the work. No separate measurement or payment will be made for filter fabric, concrete anti-seep collars, sediment clean out indicator post, perforated CMP and #57 stone, but shall be included in the unit price per each retrofitting. All concrete anti-seep pipe collars and sediment clean out indicator posts shall be incidental to the construction of each pond or basin.

Payment will be made under:

Item D-700-4.01 Stone Retrofitting - per Each.

END OF SECTION D-700

Item D-701 Pipe for Storm Drains and Culverts

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with 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. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

701-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements:

~~American Association of State Highway and Transportation Officials (AASHTO) M167~~	~~Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches~~
~~AASHTO M190~~	~~Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches~~
~~AASHTO M196~~	~~Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains~~
~~AASHTO M219~~	~~Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches~~
~~AASHTO M243~~	~~Standard Specification for Field-Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches~~
~~AASHTO M294~~	~~Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter~~
~~AASHTO M304~~	~~Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter~~
~~AASHTO MP20~~	~~Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter~~
AASHTO R73	Standard Practice for Evaluation of Precast Concrete Drainage Productions
~~ASTM A760~~	~~Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains~~
~~ASTM A761~~	~~Standard Specification for Corrugated Structural Steel Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches~~
~~ASTM A762~~	~~Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains~~
~~ASTM A849~~	~~Standard Specification for Post Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe~~
~~ASTM B745~~	~~Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains~~
ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe

ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
~~ASTM C507~~	~~Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe~~
~~ASTM C655~~	~~Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe~~
~~ASTM C1433~~	~~Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers~~
ASTM C1479	Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations
~~ASTM C1577~~	~~Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD~~
~~ASTM C1786~~	~~Standard Specification for Segmental Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD~~
ASTM C1840	Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe
~~ASTM D3262~~	~~Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe~~
~~ASTM D4161~~	~~Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals~~
~~ASTM F667~~	~~Standard Specification for 3 through 24 in Corrugated Polyethylene Pipe and Fittings~~
~~ASTM F714~~	~~Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter~~
~~ASTM F894~~	~~Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe~~
~~ASTM F949~~	~~Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings~~
~~ASTM F2435~~	~~Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe~~
~~ASTM F2562~~	~~Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage~~
~~ASTM F2736~~	~~Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe~~
~~ASTM F2764~~	~~Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications~~
~~ASTM F2881~~	~~Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications~~
~~ASTM D3034~~	~~Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings~~

701-2.3 Concrete. Concrete for pipe cradles shall have a minimum compressive strength of 2000 psi (13.8 MPa) at 28 days and conform to the requirements of ASTM C94.

701-2.4 Rubber gaskets. [Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe, polyethylene, and polypropylene pipe shall conform to the requirements of ASTM

F477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F477.

701-2.5 Joint mortar. Pipe joint mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

701-2.6 Joint fillers. Poured filler for joints shall conform to the requirements of ASTM D6690.

701-2.7 Plastic gaskets. Plastic gaskets shall conform to the requirements of ASTM C990.

701-2.8. Controlled low-strength material (CLSM). Not used.

*

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or American Concrete Pipe Association QCast Plant Certification program.

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 12 inches (300 mm) on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch (200 mm) or 1/2 inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform 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 granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

The excavation for pipes 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 bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

a. Rigid pipe. The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed uncompacted material under the middle third of the pipe prior to placement of the 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:~~

~~Flexible Pipe Bedding~~

~~Pipe Corrugation Depth~~		~~Minimum Bedding Depth~~	
~~inch~~	~~mm~~	~~inch~~	~~mm~~
~~1/2~~	~~12~~	~~1~~	~~25~~
~~1~~	~~25~~	~~2~~	~~50~~
~~2~~	~~50~~	~~3~~	~~75~~
2-1/2	60	3-1/2	90

c. Other pipe materials. ~~For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches (19 mm). For pipes installed under paved areas, no more than 12% of the material shall pass the No. 200 (0.075 mm) sieve. For all other areas, no more than 50% of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) 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 the 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) cement mortar, (2) cement grout, (3) rubber gaskets, (4) plastic gaskets, (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 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. Pipe sections at joints shall be fully seated and the inner surfaces flush and even. Concrete pipe joints shall be sealed with butyl mastic meeting ASTM C990 or mortar when soil tight joints are required. Joints shall be thoroughly wetted before applying mortar or grout.

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 M196 for aluminum pipe.~~

c. PVC, Polyethylene, or Polypropylene pipe. ~~Joints for PVC, Polyethylene, or Polypropylene pipe shall conform to the requirements of ASTM D3212 when leak resistant joints are required. Joints for PVC and Polyethylene pipe shall conform to the requirements of AASHTO M304 when soil tight joints are required. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M252 or ASTM M294. Fittings for polypropylene pipe shall conform to ASTM F2881, ASTM F2736, or ASTM F2764.~~

d. Fiberglass pipe. ~~Joints and fittings shall be as detailed on the plans and in accordance with the manufacturers recommendations.~~

701-3.5 Embedment and Overfill. Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

701-3.5-1 Embedment Material Requirements

a. Concrete Pipe. Embedment material and compaction requirements shall be in accordance with the applicable Type of Standard Installation (Types 1, 2, 3, or 4) per ASTM C1479. If a concrete cradle or CLSM embedment material is used, it shall conform to the plan details.

b. Plastic and fiberglass Pipe. ~~Embedment material shall meet the requirements of ASTM D3282, A-1, A-2-4, A-2-5, or A-3. Embedment material shall be free of organic material, stones larger than 1.5 inches in the greatest dimension, or frozen lumps. Embedment material shall extend to 12 inches above the top of the pipe.~~

c. Metal Pipe. ~~Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.~~

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Thoroughly compact the embedment material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

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 Overfill

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be place and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D698 The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

701-3.7 Inspection Requirements

An initial post installation inspection shall be performed by the RPR no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition. The video image shall be clear, focused, and relatively free from roll, static, or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe.

Incorporate specific inspection requirements for the various types of pipes beneath the general inspection requirements.

Reinforced concrete pipe shall be inspected, evaluated, and reported on in accordance with ASTM C1840, "Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe." Any issues reported shall include still photo and video documentation. The zoom ratio shall be provided for all still or video images that document any issues of concern by the inspection firm.

METHOD OF MEASUREMENT

701-4.1 The length of pipe shall be measured in linear feet of pipe in place, completed, and accepted. It shall 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. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

701-4.2 Trenching shall be measured by the linear feet of trench, including the excavation, backfill, and restoration, completed, measured as excavated, and accepted as satisfactory. When specified, separate measurement shall be made for trenches of various specified widths.

BASIS OF PAYMENT

701-5.0 These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 701-5.01	24" RCP Storm Drain Pipe, Class III -- per linear foot
Item 701.5.02	Trenching for Storm Drain Pipe and Backfill in Soil – per linear foot
Item 701.5.03	Trenching for Storm Drain Pipe and Backfill in Rock – per Linear foot

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M167	Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M190	Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M219	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M243	Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter

AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter
ASTM International (ASTM)	
ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A761	Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A849	Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM D1056	Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes

ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2435	Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications
National Fire Protection Association (NFPA)	
NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways

END ITEM D-701

Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

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 Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

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 (90 cm) nor more than 48 inches (120 cm). There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

a. ASTM A48, Class 35B: Gray iron castings

b. ASTM A47: Malleable iron castings

c. ASTM A27: Steel castings

d. ASTM A283, Grade D: Structural steel for grates and frames

e. ASTM A536, Grade 65-45-12: Ductile iron castings

f. ASTM A897: Austempered ductile iron castings

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 ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron 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 asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. 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 RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. 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 RPR. 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 immediately before the concrete or reinforcing is placed.

c. 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. 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 disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch (9 mm) thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch (6 mm) nor more than 1/2 inch (12 mm) wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F (10°C) unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F (16°C) for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately 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 be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

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 sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. 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 or metal encapsulated steps that are embedded or built into the side walls shall be aligned and placed in accordance to ASTM C478. 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 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 RPR, 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 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 RPR. 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 seven (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 RPR. 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 seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side 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 (300 mm).

Instead of steps, prefabricated ladders may be installed. For 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 RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches (200 mm) 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 RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; 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; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.01	Catch Basins – per each
Item D-751-5.02	Construction of Pond Outlet Structure/Piping – per Each

REFERENCES

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

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

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ITEM D-753

RIP RAP

DESCRIPTION

753-1.1 This item shall consist of the construction of rip rap, surge stone, plunge basins, storm drain outlet protection aprons for culverts, check/rock dams, and other erosion control devices in accordance with these specifications, and conforming to the lines, grades, dimensions and locations shown on the drawings, or required by the Engineer.

MATERIALS

753-2.1 WASHED AGGREGATE Washed aggregate for rip rap filter blankets shall consist of quarry stone that is sound, tough, dense, resistant to the action of air and water, and suitable in all other respects for the purpose intended. The stone shall meet ASTM gradation requirements for size number materials that will produce the size range complying with the size requirements for the filter blanket specified on the drawing. The aggregate shall be uniformly graded to meet the size range of d_{max} to d_{min}, with d_{50} representing the median size of the aggregate.

753-2.2 RIP RAP Stone for rip rap shall consist of field stone or rough un-hewn quarry stone. The stone shall be sound, tough, dense, resistant to the action of air and water, and suitable in all respects for the purpose intended. The stone shall be uniformly graded to meet Type 1 or Type 3 per Section 805, Rip Rap and Curbing Stone, of the Georgia Department of Transportation "Standard Specifications Construction of Transportation Systems" (latest edition), or as designation as indicated on the plans. Neither the breadth nor the thickness of any stone shall be less than 1/3 its length. The Contractor shall provide a Letter of Certification from the quarry certifying that the aggregate materials provided under this Item meets project specifications.

753-2.3 FILTER FABRIC MATERIAL The filter fabric shall be composed of strong rot-proof synthetic fibers formed into a woven or non-woven fabric, free of any treatment or coating, which might significantly alter its physical properties after installation. The fabric shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from sunlight or heat. The fabric shall be a pervious sheet of fibers oriented into a stable network so that the fibers retain their relative position with respect to each other. The edges of the fabric shall be finished to prevent the outer fiber from pulling away from the fabric. The fabric shall be free of defects or flaws, which significantly affect its physical or filtering properties. Sheets of fabric may be sewn or bonded together. Except as otherwise specified, no deviation from any physical requirements will be permitted due to the presence of the seam.

During all periods of shipment and storage, the fabric shall be wrapped in a heavy-duty protective covering to protect the fabric from sunlight, mud, dust, dirt, and debris. The fabric shall not be exposed to temperatures greater than 140°F.

The fabric shall meet the physical requirements specified below. All strength requirements are minimum average roll values in the weakest principal direction.

PHYSICAL REQUIREMENTS

Physical Property	Test Method	Requirements
Grab Strength	ASTM D 4632	200 lb. min.
Elongation	ASTM D 4632	15% min.
Seam Strength	ASTM D 4632	180 lb. min.
Puncture Strength	ASTM D 4833	80 lb. min.
Apparent Opening Size (U.S. Standard Sieve)	ASTM D 4751	No. 100 Sieve min. No. 50 Sieve max.
Ultraviolet Degradation	ASTM D 4355	70% Strength Retained at 150 hours
Trapezoid Tear	ASTM D 4533	50 lb. min.

The Contractor shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this provision.

753-2.4 ~~DRAINAGE BLANKET MATERIAL The aggregate for the drainage blanket shall be as shown in Section 806-Aggregate for Drainage, of the Georgia Department of Transportation "Standard Specifications Construction of Transportation Systems" (latest edition).~~

CONSTRUCTION METHODS

753-3.1 PREPARING SUBGRADE Excavation shall be made to the required width and depth in accordance with the dimensions, lines, and grades shown on the drawings or required by the Engineer. Excavated material shall be disposed of as specified in Item P-152. When specified on the drawings or directed by the Engineer, a layer of filter fabric shall be placed over the completed subgrade. The properly shaped, graded and compacted subgrade shall be checked and accepted by the Engineer prior to placing any rip rap or fabric.

753-3.2 PLACING FILTER FABRIC MATERIAL The surface to receive the filter fabric shall be free of obstructions, debris, and pockets of soft or low density material.

At the time of installation, the fabric shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, storage, or installation.

The filter fabric shall be laid smooth and free from tension, stress, folds, wrinkles, or creases. Horizontal overlaps shall be a minimum of 12 inches with the upper fabric overlapping the lower fabric. Vertical overlaps shall be a minimum of 18 inches with the upstream fabric overlapping the downstream fabric. In the event that the fabric is displaced or damaged during rip rap placement, the rip rap shall be removed and the fabric repositioned or replaced prior to the replacement of the rip rap, all at no additional

cost to the Owner.

The fabric shall be covered with washed stone filter blanket within 2 days after placement of the fabric, or the fabric shall be replaced with new fabric. Filter fabric shall be protected from damage due to the placement of the filter blanket or other materials by limiting the height of drop of the material or by placing a cushioning layer of sand on top of the fabric before dumping the material.

753-3.3 PLACING RIP RAP The Contractor shall place the stone by mechanical methods, augmented by hand placing, provided that when the rip rap is completed it forms a properly graded, dense, neat layer of stone without damage to any underlying fabric. The stone shall be graded so that the smaller stones are uniformly distributed throughout the mass. The surface of the completed rip rap shall be reasonably uniform and free from excessive humps and depressions.

The thickness of the completed rip rap shall be as shown on the drawings or as specified by the Engineer.

753-3.4 SEDIMENT Sediment deposits trapped by erosion control devices shall be removed when the accumulations have reached half the capacity of the erosion control device to function properly or when so directed by the Engineer. No separate payment will be made for removal and disposal of sediment accumulations. The cost of this work shall be considered incidental to the cost of erosion control devices.

753-3.5 REMOVAL OF TEMPORARY DEVICES Temporary rip rap devices and underlying fabric shall remain in place until the Engineer directs that they be removed. Upon removal, the Contractor shall remove and dispose of any excess sediment accumulations, dress the area to give a pleasing appearance, and vegetate all bare areas in accordance with the contract requirements. The temporary rip rap and fabric materials shall remain the property of the Contractor and may be used at other locations provided the materials meet the requirements of this specification, or shall be removed from airport property.

METHOD OF MEASUREMENT

753-4.1 #57 Crushed Stone shall not be measured for payment and shall be considered incidental to the Project. The stone shall meet the requirements of GDOT specifications. The Contractor shall provide certification that stone meets gradation requirements for the #57 size. No measurement for payment shall be made for furnishing or installing filter fabric as these items are considered incidental to the placement of the #57 stone materials.

753-4.2 Rip-Rap Outlet Protection will be measured per ton installed, complete, accepted, and maintained throughout the project. These items paid for per each shall include all filter stone, filter fabric, and any other materials included for the item to meet the requirements of the erosion control plans.

753-4.3 Filter fabric or geotextiles shall be considered incidental to associated pay items.

753-4.4 Filter rings and check dams shall be measured per each installed, completed, and accepted by the Engineer. This item will include all rip rap, stone, geotextiles, and any other materials included for the item to meet the requirements on the erosion control plans.

753-4.5 ~~Surge Stone and drainage blanket will be measured per cubic yard installed, complete, accepted, and maintained throughout the project. These items paid for per each shall include all filter stone, filter fabric, and any other materials included for the item to meet the requirements of the erosion control plans.~~

753-4.6 Rock Filter Dam will be measured per each, installed, complete, accepted, and maintained throughout the project. This item will include all rip rap, stone, geotextiles, and any other materials included for the item to meet the requirements on the erosion control plans.

BASIS OF PAYMENT

753-5.1 Payment for rip rap outlet protection will be made at the contract unit price per ton installed, complete, accepted, and maintained. These prices shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; for all removal of sediment required as directed by the Engineer throughout the duration of the Project; for removal of temporary rip rap and fabrics; and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment for filter rings and check dams will be made at the contract unit price per each installed, complete, accepted, and maintained throughout the course of the project and removed. These prices shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; for removal of temporary rip rap and fabrics; and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment for rock filter dam will be made at the contract unit price per each installed, complete, accepted, and maintained throughout the course of the project and removed. These prices shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; for removal of temporary rip rap and fabrics; and for all labor, equipment, tools, and incidentals necessary to complete this item.

~~Payment for surge stone for subbase stability and drainage blanket shall be paid for by the cubic yard completed and accepted. It shall be placed to depth directed by engineer and measured.~~

Payment will be made under:

Item D-753-5.01	Rip Rap – per Ton
Item D-753-5.02	Rock Filter Dam – per Each
Item D-753-5.03	Check Dam - per Each

TESTING AND MATERIAL REQUIREMENTS

ASTM C 33	Concrete Aggregates
ASTM D 4355	Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water
ASTM D 4533	Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	Determining Apparent Opening Size of a Geotextile
ASTM D 4833	Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

END OF ITEM D-753

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ITEM E-891

INLET PROTECTION

DESCRIPTION

891-1.1 The work covered by this section consists of furnishing, placing and maintaining inlet protection at the locations and dimensions shown on the drawings or as directed by the Engineer. Inlet protection includes Inlet Filter Rings used around existing and proposed drainage structures.

MATERIALS

891-2.1 #57 STONE

Clean washed stone or gravel with 100 percent passing a 1 1/2-inch sieve and not more than 10 percent passing a 1/2-inch sieve. Specifications should meet the requirements of Item D-753.

891-2.2 RIP RAP

Rip Rap shall be Type 3 and shall meet the requirements of Item D-753.

891-2.3 INLET FILTER FABRIC

Inlet Filter Fabric shall be Type S silt fence and meet the material specification of P-156.

891-2.4 INLET SEDIMENT TRAP

Sediment trap utilizing filter fabric and posts as shown on the drawings.

CONSTRUCTION METHODS

891-3.1 CONSTRUCTION

A. Inlet filter rings shall be placed on geotextile fabric per the specifications shown on the plans. 6" layer of #57 stone shall be placed on the upstream face of the filter ring to provide filtration. Place filter stone 2 inches below the top of the filter ring on a 2:1 slope or flatter and smooth it to an even grade.

B. Area around inlet shall be excavated to provide required sediment storage as shown on construction plans. Proposed inlets shall be cored or top section of pre-case not installed to allow positive drainage at all times during construction. Filter Fabric to be installed around inlet prior to any rainfall, as shown on the plans, and as directed by engineer.

D. Inlet Sediment Traps shall be constructed per the details on the drawings

891-3.2 MAINTENANCE

Inspect protection device after each rainfall. Repair or replace damaged areas as required. Replace sediment choked filter stone or fabric with clean filter stone or fabric. Remove sediment deposits when deposition accumulates to 1/2 of height of protection device.

891-3.3 REMOVAL

When upstream areas are stabilized with 70% coverage, erosion control devices shall be removed and areas restored to original condition or per grading plan and grassed. Sediment accumulation shall be removed prior to removal of erosion control devices. This accumulation shall be disposed of off-site or as directed by the engineer and shall not be allowed to enter the streams or stormwater drainage system.

METHOD OF MEASUREMENT

891-4.1 Inlet Protection shall be measured by each installed and accepted.

BASIS OF PAYMENT

891-5.1 The quantities of Inlet Protection will be paid for at the contract unit price per each, complete, in place and accepted. This price shall be full compensation for furnishing all materials and for all preparation, excavation, placing materials, and replacing materials as required to maintain protection; and for all labor equipment, tools, and incidentals necessary to complete the protection. Cost shall also include maintenance as required per NPDES Permit GAR100001 and as specified in the construction documents throughout the project until substantial completion. Cost shall also include removal and disposal at the end of the project by approved means. Cost of filter ring, rip rap, #57 stone and filter fabric shall be incidental to Inlet Protection.

891-5.2 Payment will be made under:

Item E-891-5.01 Inlet Protection - per Each.

END OF ITEM E-891

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ITEM E-895

EROSION CONTROL MATTING

DESCRIPTION

895-1.1 The work covered by this section consists of furnishing, placing, and securing temporary jute matting, excelsior matting, or paper matting, or permanent synthetic matting at locations shown on the plans or as directed by the Engineer.

The quantity of matting to be placed will be affected by the actual conditions which occur during the construction of the project. The quantity of matting may be increased, decreased, or eliminated entirely at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

MATERIALS

895-2.1 TEMPORARY MATTING MATERIAL:

A. General. Matting shall be jute matting, excelsior matting, or paper matting. Other acceptable material manufactured especially for erosion control may be used when approved by the Engineer in writing before being used. Erosion control matting shall not be dyed, bleached, or otherwise treated in a manner that will result in toxicity to vegetation.

B. Jute Matting. Jute matting shall be of a uniform open plain weave of single jute yarn, 48 inches in width plus or minus 1 inch. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. There shall be 78 warp ends, plus or minus 2, per linear yard; and the weight shall average 1.122 pounds per linear yard of the matting with a tolerance of plus or minus 5 percent.

C. Excelsior Matting. Excelsior matting shall consist of a machine produced mat of curled wood excelsior at least 47 inches in width. The mat shall weigh 0.975 pounds per square yard with a tolerance of plus or minus 10 percent. At least 80 percent of the individual excelsior fibers shall be evenly distributed over the entire area of the blanket. One side of the excelsior matting shall be covered with a woven fabric of twisted paper cord or cotton cord, or with an extruded plastic mesh. The mesh size for either the fabric or plastic mesh shall be a minimum of 1 inch x 1 inch and a maximum of 1 1/2 inches x 3 inches.

D. Paper Matting. Paper matting shall consist of a knitted polypropylene yarn with uniform openings through which biodegradable paper strips have been continuously interwoven. The openings shall be no greater than 3/4 inch in their greatest dimension and 1/2 inch in their least dimension. The interwoven yarn and paper shall form a flexible mat which will stretch in any direction so as to conform to the shape of an irregular surface when applied to such surface.

Paper matting shall be 3.6 feet or more in width and weigh a minimum of 0.09 pound per square yard.

E. Wire Staples. Staples shall be machine made of No.11 gage steel wire formed into a "U" shape. The size when formed shall be not less than 6 inches in length with a throat of not less than 1 inch in width.

895-2.2 PERMANENT MATTING:

A. Material. The permanent matting shall consist of a web of mechanically or melt bonded polymer nettings, monofilaments or fibers which are entangled to form a strong and dimensionally stable matrix. Methods of bonding shall include polymer welding, thermal or polymer fusion, or the placement of fibers between two high strength, biaxially oriented nets bound securely together by parallel lock stitching with polyolefin threads. The matting shall possess strength and elongation properties to limit stretching and shall maintain its shape before, during and after installation, under dry or water saturated conditions. All components of the matting shall be stabilized against ultraviolet degradation and shall be inert to chemicals normally encountered in a natural soil environment. The matting shall conform to the following physical properties:

PROPERTY	TEST METHOD	VALUE[1]
> Thickness	ASTM D-1777	0.5
> Resiliency (%)[2]	ASTM D-1777	80
> Weight (oz/sy)	ASTM D-3776	11
> Porosity (%)[3]	Calculated	90
> Ground Cover Factor (%)[4]	Light Projection Analysis	66
> Tensile Strength (lb/ft)[5]	ASTM D-1682	130 x 120
> Tensile Elongation (%)[5]	ASTM D-1682	75 x 75 (max)
> Ultraviolet Stability (%)[6]	ASTM D-4355	80

NOTES:

1. All values are minimum average roll values unless otherwise indicated.

2. Resiliency defined as percent of original thickness retained after 3 cycles of a 100 psi load for 60 seconds followed by 60 seconds without load. Thickness measured 30 minutes after load removed by ASTM D-1777.

3. Porosity calculation based upon unit weight, thickness and specific gravity.

4. Ground Cover Factor represents "% shade" from Lumite Light Projection Test.

5. Values for both machine and cross machine directions under dry or saturated conditions.

6. Tensile strength retained after 1000 hours in a Xenon ARC Weatherometer.

B. Stakes or Staples. Wood stakes shall be sound 1 inch x 3 inch stock sawn in a triangular shape, and shall be from 12 inches to 18 inches long depending on the compaction of the soil. Metal staples shall be 11 gauge steel or greater, "U" shaped, with legs a minimum of 8" in length and with a 2" crown.

CONSTRUCTION METHODS

895-3.1 MANUFACTURER'S INSTRUCTIONS: Except as otherwise specified herein or approved by the Engineer, each type of matting shall be installed in accordance with its manufacturer's printed instructions.

895-3.2 TEMPORARY MATTING INSTALLATIONS: Placing of matting shall be done immediately following seeding. The earth surface shall be smooth and free from stones, clods, or debris which will prevent the contact of the matting with the soil. Care shall be taken to preserve the required line, grade, and cross section of the area covered.

Matting shall be unrolled in the direction of the flow of water, and shall be applied without stretching so that it will lie smoothly but loosely on the soil surface. The

up-channel or top of slope end of each piece of matting shall be buried in a narrow trench at least 5 inches deep. After the end of the matting is buried, the trench shall be closed and tamped firmly. Where one roll of matting ends and a second roll begins, the end of the upper roll shall be brought over the buried end of the second roll so that there will be a 6 inch overlap. Check slots shall be constructed at each 50 feet longitudinally in the matting or as directed by the Engineer. These slots shall be narrow trenches at least 5 inches deep. The matting shall be folded over and buried to the full depth of the trench, after which the trench shall be closed and firmly tamped. Where 2 or more widths of matting are laid side by side, the overlap shall be at least 4 inches.

Staples shall be placed across matting at ends, junctions, and check slots and shall be spaced approximately 10 inches apart.

Staples shall be placed along the outer edges and down the center of each strip of matting and shall be spaced 3 feet apart. Staples shall also be placed along all lapped edges 2 to 3 feet apart.

When excelsior matting is used, the matting shall be installed with the fabric on the top side.

After matting has been placed and stapling completed, the matting shall be rolled with an approved roller to assure that it is in proper contact with the soil.

In the installation of matting on cut or fill slopes, the Engineer may require adjustments in the trenching or stapling requirements to fit individual slope conditions.

895-3.3 PERMANENT MATTING INSTALLATION:

A. Site Preparation. All areas to be protected with the permanent matting shall be brought to final grade and seeded in accordance with Item T-901. The surface of the soil shall be smooth, firm, stable, and free of rock, clods, roots, or other obstructions which would prevent the matting from lying in direct contact with the soil surface. Do not use the matting in areas where rock outcroppings occur or large rocks are numerous.

B. Installation of Matting in Ditches. A transverse trench 6 inches wide by 9 inches deep shall be cut at the ends of the matting and at 25 foot intervals along the ditch. Longitudinal anchor slots may be specified by the Engineer if large volumes of water are anticipated.

The center of matting shall be rolled out starting at the lower end of the ditch. Each adjacent strip of matting shall be then be rolled out overlapping the preceding strip a minimum of 3 inches. The ends of each roll of matting shall be overlapped 3 feet with the upslope matting on top. The matting shall be stretched to the bottom of the slot, folded back and staked at one foot intervals in each anchor slot with one stake serving the overlapped edges of adjoining stripes. The slot is then backfilled and compacted. The matting shall then be staked snugly in the longitudinal slots and at maximum intervals of 6 feet along the ditch. The longitudinal anchor slots shall then be backfilled and dressed.
Runs of matting which begin at the outlet of a pipe shall be underlain with filter fabric for a distance of 10 feet.

C. Installation of Matting on Slopes. Installation of matting on slopes shall be the same as for ditches except as follows: No longitudinal anchor slots are required. The entire slope shall be backfilled with loose soil to fill the voids in the mat.

D. Grassing. Designated areas to receive permanent matting shall be seeded prior to installation of matting as directed by the Engineer.

E. Inspection. A representative of the matting manufacturer shall be present during installation to assure that the matting is installed per the manufacturer's printed instructions.

METHOD OF MEASUREMENT

895-4.1 The quantity of temporary and permanent erosion control matting to be paid for shall be the number of square yards, measured along the surface of the ground, over which temporary erosion control matting has been acceptably placed and maintained. Delivery tickets are not an acceptable basis for measurement.

BASIS OF PAYMENT

895-5.1 The quantity of temporary and permanent erosion control matting, measured as provided above shall be paid for at the contract unit price per square yard. Overlap of matting shall not be measured for payment.

The above price and payment shall be full compensation for all work covered by this section, including but not limited to furnishing all matting, staples, and other materials; and placing and securing the matting. Grassing shall be paid for under Item T-901.

Payment will be made under:

Item E-895-5.01 Temporary Erosion Control Matting -- per Square Yard.

Item E-895-5.02 Permanent Erosion Control Matting -- per Square Yard.

TESTING AND MATERIAL REQUIREMENTS

ASTM D-1682	Tensile Strength and Elongation
ASTM D-1777	Material Thickness
ASTM D-3776	Weight of Materials
ASTM D-4355	Ultraviolet Stability

END OF ITEM E-895

Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2.1 General. All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

101-2.2 Milling Machine. The asphalt surface removal equipment shall be a power operated mechanical scarifier, roto-mill, planning machine, grinder or other device capable of removing the surface to the specified width and depth indicated leaving a sound, bondable surface. The equipment shall be in good working condition free from oil or fuel leaks. Power brooms and sweepers, vacuum sweepers and air compressors shall be in good working condition and shall be used in sufficient numbers or combinations to remove dust and debris from the milled surface.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 4 inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil If the material is to be wasted on the airport site, it shall be broken to a maximum size of 4 inches.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch wide with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch, not to exceed ¼ inch. Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Gradation

Sieve Size	*Percent Passing*
No. 4 (4.75 mm)	*100*
No. 8 (2.36 mm)	*90-100*
No. 16 (1.18 mm)	*65-90*
No. 30 (600 µm)	*40-60*
No. 50 (300 µm)	*25-42*
No. 100 (150 µm)	*15-30*
No. 200 (75 µm)	*10-20*

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay / seal-coat / remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

High-pressure water, rotary grinding, or sandblasting may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. ~~The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches in depth. This method of repair applies only to pavement to be overlaid~~.

b. Asphalt pavement repair. ~~The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications~~.

101-3.5 Asphalt Pavement milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed of on Airport property as directed by the Engineer. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

a. Survey. Prior to milling operations, the Contractor shall perform a ground run topographic survey of the existing runway and connecting taxiways using a total station survey instrument. Topographic mapping using GPS, LIDAR, or Photogrammetry will not be accepted. The limits of this survey shall extend 50 feet beyond the edge of pavement and encompass the entire length and width of the paved runway surface as well as the paved connecting taxiways to a distance 280 feet from the existing runway centerline. Survey shall be accurate to 0.01'. The survey shall be shot at the same locations shown on the staking plan. Any areas where the Contractor's survey varies from the existing elevation shown on the plans by more than 0.04' shall be highlighted. The survey shall be performed by and sealed by a Registered Land Surveyor in the State of Kentucky. Provide the completed survey in PDF and CAD format. The Engineer reserves the right to adjust the milling plan based on the provided survey data. The Contractor will be allowed five days to complete this work and shall coordinate with the airport for access to the Runway. The personnel performing the survey shall be escorted by airport operations or engineer personnel. Survey vehicles shall be marked and lit in accordance with FAA AC 150/5210-5D. Provide the completed survey to the Engineer for analysis sufficiently in advance of the planned start of work.

After the completion of milling operations, the Contractor shall perform a ground run topographic survey of the milled runway surface and connecting taxiways using a total station survey instrument to verify the mill-to grades have been met. Topographic mapping using GPS, LIDAR, or Photogrammetry will not be accepted. The limits of this survey shall encompass the entire length and width of the paved runway surface as well as the paved connecting taxiways to a distance 280 feet from the existing runway centerline. Survey shall be accurate to 0.01'. The survey shall be shot at the same locations shown on the staking plan. The survey shall be performed by and sealed by a Registered Land Surveyor in the State of Kentucky. Provide the completed survey in PDF and CAD format. The Engineer reserves the right to adjust the paving plan based on the provided survey data. Provide the completed survey to the Engineer for analysis sufficiently in advance of planned paving operations.

After the completion of asphalt leveling operations, the Contractor shall perform a ground run topographic survey of the runway surface and connecting taxiways using a total station survey instrument to verify the asphalt leveling grades have been met. Topographic mapping using GPS, LIDAR, or Photogrammetry will not be accepted. The limits of this survey shall encompass the entire length and width of the paved runway surface as well as the paved connecting taxiways to a distance 280 feet from the existing runway centerline. Survey shall be accurate to 0.01'. The survey shall be shot at the same locations shown on the staking plan. The survey shall be performed by and sealed by a Registered Land Surveyor in the State of Kentucky. Provide the completed survey in PDF and CAD format. The Engineer reserves the right to adjust the final paving plan based on the provided survey data. Provide the completed survey to the Engineer for analysis sufficiently in advance of planned final paving operations.

b. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The RPR shall layout the area to be milled with a straightedge in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

c. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of in areas designated on the plans.

d. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed of off Airport property.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. ~~Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint~~.

101-3.8.1 Removal of Existing Joint Sealant. ~~All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry~~.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with Item P-605 and / or Item P-604.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by routing. Following routing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. *Remove the types of pipe as indicated on the plans. The pipe material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D1557.*

b. Removal of Inlets/Manholes. *Where indicated on the plans or as directed by the RPR, inlets and/or manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent*

embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D698.

METHOD OF MEASUREMENT

101-4.1 Pavement Removal. ~~The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No. direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.~~

101-4.2 Full Depth Pavement Milling. The unit of measurement for asphalt pavement milling shall be the number of square yards milled by the Contractor, regardless of depth or the number of passes required to achieve the depths as indicated on the plans. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to asphalt pavement milling.

101-4.3 Drainage Structure Removal. The unit of measurement for removal of buried structures will be made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4.

101-4.4 Pipe Removal. The unit of measurement for removal of pipe shall be the number of linear feet removed by the Contractor. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at the contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-101-5.01 Full Depth Pavement Milling – per square yard

Item P-101-5.02 Drainage Structure Removal – per each

Item P-101-5.03 Pipe Removal – per linear foot

REFERENCES

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

Advisory Circulars (AC)

AC 150/5380-6 Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. *Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature which is not classified and paid for under one of the following items.*

b. Rock excavation. *Rock excavation shall include all solid rock in ledges, in bedded deposits, in unstratified masses, and conglomerate deposits which are so firmly cemented they cannot be removed without blasting or using rippers. All boulders containing a volume of more than 1/2 cubic yard (0.4 m3) will be classified as "rock excavation."*

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed of in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR. The RPR and Owner's Quality Assurance Testing Firm are the sole authority in determining whether or not material is unsuitable.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches, to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary

precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. *Blasting shall not be allowed*

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files will be issued to the successful bidder upon request.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot of the stated elevations for ground surfaces, or within 0.04 foot for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement

subgrade. 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 until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed off the airport. The cost is incidental to this item. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as rock excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. *On-airport borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the RPR. All unsuitable material shall be disposed of by the Contractor as shown on the plans. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be graded to drain, and left in a neat, presentable condition with all slopes dressed uniformly. On-airport borrow areas shall be seeded in accordance with the specifications. The seeding of on-airport borrow areas is considered incidental to the work.*

If needed, the Contractor shall locate and obtain off-airport borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least 15 days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Off-airport borrow areas shall be seeded in accordance with the specifications. The seeding of off-airport borrow areas is considered incidental to the work.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches

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

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches of subgrade shall be compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches 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.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 12 inches of compacted thickness.

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

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in 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 surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The Contractor will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the Contractor for every 3,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12 inches and to a density of not less than 100% of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches in their greatest dimensions will not be allowed in the top 12 inches of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, and after compaction is completed, the subgrade area shall be proof rolled with a 20-ton Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 80 psi or a 20 ton Proof Roller with tires spaced not more than 32 inches on-center with tires inflated to 100 psi in the presence of the RPR. Apply a minimum of two coverages, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch or show permanent deformation greater than 1 inch shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch sieve, follow the methods in ASTM D1557 procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. Tests for moisture content and compaction will be taken at a minimum of 3,000 S.Y. of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

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 RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling

and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

b. Grade. The grade and crown shall be measured on a 50-foot grid and shall be within +/-0.05 feet of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard (cubic meter) shall be computed by **the comparison of digital terrain model (DTM) surfaces** for computation of neat line design quantities. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

152-3.2 *The quantity of* **unclassified, rock, and unsuitable** *excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.*

152-3.3 *Stockpiled material shall not be measured for payment in the stockpiled position.*

BASIS OF PAYMENT

152-4.1 Unclassified Excavation, Rock Excavation, and Unsuitable Excavation payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-4.01	Unclassified Excavation - per cubic yard
Item P-152-4.02	Rock Excavation - per cubic yard
Item P-152-4.03	Unsuitable Excavation - per cubic yard

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2	Operational Safety on Airports During Construction

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66 Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

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Item P-155 Lime-Treated Subgrade

DESCRIPTION

155-1.1 This item shall be used for soil modification that require strength gain to a specific level. This item shall consist of constructing one or more courses of a mixture of soil, lime, and water in accordance with this specification, and in conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans.

MATERIALS

155-2.1 Lime. Quicklime, hydrated lime, and either high-calcium dolomitic, or magnesium lime, as defined by ASTM C51, shall conform to the requirements of ASTM C977. Lime not produced from calcining limestone is not permitted.

155-2.2 Commercial lime slurry. Commercial lime slurry shall be a pumpable suspension of solids in water. The water or liquid portion of the slurry shall not contain dissolved material injurious or objectionable for the intended purpose. The solids portion of the mixture, when considered on the basis of "solids content," shall consist principally of hydrated lime of a quality and fineness sufficient to meet the following chemical composition and residue requirements.

a. Chemical composition. The "solids content" of the lime slurry shall consist of a minimum of 70%, by weight, of calcium and magnesium oxides.

b. Residue. The percent by weight of residue retained in the "solids content" of lime slurry shall conform to the following requirements:

Residue retained on a No. 6 (3.35 μm) sieve = maximum 0.0%

Residue retained on a No. 10 (2.00 μm) sieve = maximum 1.0%

Residue retained on a No. 30 (600 μm) sieve = maximum 2.5%

c. Grade. Commercial lime slurry shall conform to one of the following two grades:

Grade 1. The "dry solids content" shall be at least 31% by weight, of the slurry.

Grade 2. The "dry solids content" shall be at least 35%, by weight, of the slurry.

155-2.3 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

155-2.4 Soil. The soil for this work shall consist of on-site materials free of roots, sod, weeds, and stones larger than 2-1/2 inches (60 mm) and have a sulfate content of less than 0.3%.

COMPOSITION

155-3.1 Soil-lime mixture. Lime shall be applied at 6 % dry unit weight of soil for the depth of subgrade treatment as shown on the plans.

155-3.2 Tolerances. At final compaction, the lime and water content for each course of subgrade treatment shall conform to the following tolerances:

Tolerances

Material	Tolerance
Lime	+ 0.5%
Water	+ 2%, -0%

WEATHER LIMITATIONS

155-4.1 Weather limitation. Subgrade shall not be constructed when weather conditions detrimentally affect the quality of the materials. Lime shall not be applied unless the air temperature is at least 40°F (4°C) and rising. Lime shall not be applied to soils that are frozen or contain frost. Protect completed lime-treated areas by approved methods against the detrimental effects of freezing if the air temperature falls below 35°F (2°C). Remove and replace any damaged portion of the completed soil-lime treated area with new soil-lime material in accordance with this specification.

EQUIPMENT

155-5.1 Equipment. All equipment necessary to grade, scarify, spread, mix and compact the material shall be provided. The Resident Project Representative (RPR) must approve the Contractor's proposed equipment prior to the start of the treatment.

CONSTRUCTION METHODS

155-6.1 General. This specification is to construct a subgrade consisting of a uniform lime mixture which shall be free from loose or segregated areas. The subgrade shall be of uniform density and moisture content, well mixed for its full depth, and have a smooth surface suitable for placing subsequent lifts. The Contractor shall be responsible to meet the above requirements.

Prior to any treatment, the subgrade shall be constructed as specified in Item P-152, Excavation, Subgrade and Embankment, and shaped to conform to the typical sections, lines, and grades as shown on the plans.

The mixing equipment must give visible indication at all times that it is cutting, pulverizing and mixing the material uniformly to the proper depth over the full width of the cut.

155-6.2 Application. Lime shall be uniformly spread only over an area where the initial mixing operations can be completed during the same work day. Lime shall not be applied when wind conditions are detrimental to proper application. A motor grader shall not be used to spread the lime. Adequate moisture shall be added to the cement/soil mixture to maintain the proper moisture content. Materials shall be handled, stored, and applied in accordance with all federal, state, and local requirements.

155-6.3 Mixing. The mixing procedure shall be as described below:

a. Preliminary mixing. The full depth of the treated subgrade shall be mixed with an approved mixing machine. Lime shall not be left exposed for more than six (6) hours. The mixing machine shall

make two coverages. Water shall be added to the subgrade during mixing to provide a moisture content approximately 3% to 5% above the optimum moisture of the material and to ensure chemical reaction of the lime and subgrade. After mixing, the subgrade shall be lightly rolled to seal the surface and help prevent evaporation of moisture. The water content of the subgrade mixture shall be maintained at a moisture content above the optimum moisture content for a minimum of 4 to 24 hours or until the material becomes friable. During the mellowing period, the material shall be sprinkled as directed by the RPR.

b. Final mixing. After the required mellowing time, the material shall be uniformly mixed by approved methods. Any clods shall be reduced in size by blading, discing, harrowing, scarifying, or by the use of other approved pulverization methods. After curing, pulverize lime treated material until 100% of soil particles pass a one-inch (25.0 mm) sieve and 60% pass the No. 4 (4.75 mm) sieve when tested dry by laboratory sieves. If resultant mixture contains clods, reduce their size by scarifying, remixing, or pulverization to meet specified gradation.

155-6.4 Control Strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. Upon acceptance of the control strip by the RPR, the Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

155-6.5 Treatment Application and Depth Checks. The depth and amount of stabilization shall be measured by the Contractor with no less than 2 tests per day of material placed; test shall be witnessed by the RPR. Measurements shall be made in test holes excavated to show the full depth of mixing and the pH checked by spraying the side of the test hole with a pH indicator such as phenolphthalein. Phenolphthalein changes from clear to red between pH 8.3 and 10. The color change indicates the location of the bottom of the mixing zone. pH indicators other than phenolphthalein can be used to measure pH levels. If the pH is not at least 8.3 and/or if the depth of the treated subgrade is more than 1/2 inch (12 mm) deficient, additional lime treatment shall be added and the material remixed. The Contractor shall correct all such areas in a manner satisfactory to the RPR.

155-6.6 Compaction. Compaction of the mixture shall immediately follow the final mixing operation with the mixture compacted within 1 to 4 hours after final mixing. The material shall be at the moisture content specified in paragraph 155-3.2 during compaction. The field density of the compacted mixture shall be at least 95% of the maximum density as specified in paragraph 155-6.10. Perform in-place density test to determine degree of compaction between 24 and 72 hours after final compaction and the 24-hour moist cure period. If the material fails to meet the density requirements, it shall be reworked to meet the density requirements. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

155-6.7 Finishing and curing. After the final lift or course of lime-treated subgrade has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The completed section shall then be finished by rolling, as directed by the RPR, with a pneumatic or other suitable roller sufficiently light to prevent hairline cracking. The finished surface shall not vary more than 1/2-inch (12 mm) when tested with a 12-foot (3.7 m) straightedge applied

parallel with and at right angles to the pavement centerline. Any variations in excess of this tolerance shall be corrected by the Contractor at the Contractor's expense in a manner satisfactory to the RPR.

The completed section shall be moist-cured for a minimum of seven (7) days before further courses are added or any traffic is permitted, unless otherwise directed by the RPR. The final lift should not be exposed for more than 14 days without protection or the placement of a base course material.

155-6.8 Maintenance. The Contractor shall protect and maintain the lime-treated subgrade from yielding until the lime-treated subgrade is covered by placement of the next lift. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meets all specification requirements. The maintenance cost shall be incidental to this item.

155-6.9 Surface tolerance. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/-0.05 feet (15 mm) of the specified grade.

155-6.10 Acceptance sampling and testing. The lime treated subgrade shall be accepted for density and thickness on an area basis. Testing frequency shall be a minimum of one compaction and thickness test per 1000 square yards of lime treated subgrade, but not less than four (4) tests per day of production. Sampling locations will be determined on a random basis per ASTM D3665.

a. Density. All testing shall be done by the Contractor's laboratory in the presence of the RPR and density test results shall be furnished upon completion to the RPR for acceptance determination.

The field density of the compacted mixture shall be at least 95% of the maximum density of laboratory specimens prepared from samples taken from the material in place. The specimens shall be compacted and tested in accordance with ASTM D698 to determine maximum density and optimum moisture content. The in-place field density shall be determined in accordance with ASTM D6938, Procedure A, direct transmission method. If the material fails to meet the density requirements, the area represented by the failed test shall be reworked to meet the density requirements. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. The thickness of the course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by survey done by the Contractor in the presence of the RPR for each area. The survey shall be done before and after the placement of the lime stabilized layer. The survey shall be done on the same locations shown on the staking plan. Where the thickness is deficient by more than 1/2-inch (12 mm), the Contractor shall correct such areas at no additional cost.

155-6.11 Handling and safety. The Contractor shall obtain and enforce the lime supplier's instructions for proper safety and handling of the lime to prevent physical eye or skin contact with lime during transport or application.

METHOD OF MEASUREMENT

155-7.1 Lime-treated subgrade shall be paid for by the square yard in the completed and accepted work.

155-7.2 Lime shall be paid by the number of tons of Hydrated Lime applied at the application rate specified in paragraph 155-3.1.

a. Hydrated lime delivered to the project in dry form will be measured according to the actual tonnage either spread on the subgrade or batched on site into a slurry, whichever is applicable.

b. Quicklime delivered to the project in dry form will be measured for payment on the basis of the tons of equivalent hydrated lime using the following formula:

$$\text{Equivalent Hydrated Lime } (Ca(OH)_2) = \text{Total Quicklime } (CaO) \times 1.32$$

c. Lime delivered to the project in slurry form will be measured for payment in tons, dry weight of hydrated lime or equivalent hydrated lime in accordance with paragraph b above.

BASIS OF PAYMENT

155-8.1 Payment shall be made at the contract unit price per square yard for the lime-treated subgrade at the thickness specified. The price shall be full compensation for furnishing all material, except the lime, and for all preparation, delivering, placing and mixing these materials, and all labor, equipment, tools and incidentals necessary to complete this item.

155-8.2 Payment shall be made at the contract unit price per ton of lime. This price shall be full compensation for furnishing, delivery, and placing this material.

Payment will be made under:

Item P-155-8.01	Lime-treated subgrade - per square yard
Item P-155-8.02	Lime - per ton

REFERENCES

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

ASTM International (ASTM)

ASTM C51	Standard Terminology Relating to Lime and Limestone (as used by the Industry)
ASTM C977	Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

END OF ITEM P-155

Item P-209 Crushed Aggregate Base Course

DESCRIPTION

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

MATERIALS

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

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

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

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

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch (50 mm)	100		0
1-1/2 inch (37.5 mm)	95-100		±5
1 inch (25.0 mm)	70-95		±8
3/4 inch (19.0 mm)	55-85		±8
No. 4 (4.75 mm)	30-60		±8
No. 40[2] (425 μm)	10-30		±5
No. 200[2] (75 μm)	0-10		±3

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

[2] The fraction of material passing the No 200 (75 μm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 μm) sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least **two** aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. *Separation geotextile shall be* **Class 2, 0.02 sec-1** *permittivity per ASTM D4491, Apparent opening size per ASTM D4751 with* **0.60 mm** *maximum average roll value.*

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) of compacted thickness.

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

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least **100%** of the maximum density of laboratory specimens prepared from samples of the subbase material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with **ASTM D1557**. The moisture content of the material during placing operations shall be within ± 2 percentage points of the optimum

moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

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

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

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

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

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds. Sampling locations will be determined on a random basis per ASTM D3665

a. Density. *The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance.*

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM 1557. The in-place field density shall be determined per ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. *Survey shall be performed by the contractor prior to the placement and completion of the crushed aggregate base course. Survey shall be taken on locations shown in the staking plan*. The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by survey taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by

scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of **square yards** of material at the specified depth actually constructed and accepted by the RPR as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

209-4.2 Separation geotextile shall be measured by the number of **square yards** of materials placed and accepted by the RPR as complying with the plans and specifications excluding seam overlaps and edge anchoring.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per **square yard** for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

209-5.2 Payment shall be made at the contract unit price per **square yard** for separation geotextile. The price shall be full compensation for furnishing all labor, equipment, material, anchors, and incidentals necessary.

Payment will be made under:

Item P-209-5.01	Crushed Aggregate Base Course – per cubic yard
Item P-209-5.02	Separation geotextile – per square yard

REFERENCES

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

ASTM International (ASTM)

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-μm (No. 200) Sieve in Mineral Aggregates by Washing
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 C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates

ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

Item P-602 Emulsified Asphalt Prime Coat

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F (10°C) or above, and the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

602-3.2 Equipment. The equipment shall include a self-powered pressure asphalt material distributor and equipment for heating asphalt material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the asphalt material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 1.0 gallons per square yard (0.23 to 4.5 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard (0.68 to 1.36 liters per square meter) depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet (30 m) for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

602-4.1 The emulsified asphalt material for prime coat shall be measured by the **gallon**. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D4311. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment. BASIS OF PAYMENT

602-5.1 Payment shall be made at the contract unit price per **gallon** for emulsified asphalt prime coat. This price shall be full compensation for furnishing all materials and for all preparation, delivering, and applying the materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-602-5.01 Emulsified Asphalt Prime Coat - per gallon

REFERENCES

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

ASTM International (ASTM)

ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END OF ITEM P-602

Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F or above; the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven hundred (700) feet per minute.

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY	Emulsion Application Bar Rate, gal/SY
New asphalt	0.02-0.05	0.03-0.07
Existing asphalt	0.04-0.07	0.06-0.11
Milled Surface	0.04-0.08	.0.06-0.12
Concrete	0.03-0.05	0.05-0.08

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the **gallon**. Volume shall be corrected to the volume at 60°F in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per **gallon** of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-5.01 Emulsified Asphalt Tack Coat – per gallon

REFERENCES

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

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint Sealants. Joint sealant materials shall meet the requirements of ASTM D6690.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer Rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond Breaking Tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°f (3°c) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of Application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°f (10°c) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work, including descriptive data, 14 days prior to use on the project.

A. **Tractor-mounted routing tool.** Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

B. **Concrete saw.** Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

C. **Sandblasting equipment.** Sandblasting is not allowed.

D. **Hand tools.** Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

E. **Hot-poured sealing equipment.** The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so

that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

F. Cold-applied, single-component sealing equipment. The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of Joints. pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. the contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

A. Sawing. All joints shall be sawed in accordance with specifications and plan details. immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

B. Sealing. immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. cleaning shall be accomplished by saw as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. sandblasting shall be accomplished in a minimum of two passes. one pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. After finishing the final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

C. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

D. Bond-Breaking Tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of Sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR, before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch below the top of pavement surface; or bottom of groove for grooved pavement. remove and discard excess or spilled sealant from the pavement by approved methods. install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants

exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 Joint sealing material shall be measured by the linear foot (meter) of sealant in place, completed, and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint sealing material shall be made at the contract unit price per linear foot (meter). The price shall be full compensation for furnishing all materials, for all preparation, delivering, 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-605-5.01	Sawcut and Seal Joint - per linear foot

REFERENCES

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

ASTM International (ASTM)

ASTM D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

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Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. 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 in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking.

Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

Crushed granite, calcite cemented sandstone, quartzite, basalt, diabase, rhyolite or trap rock are considered to meet the D-cracking test requirements but must meet all other quality tests specified in Item P-501.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements presented in the table below.

Cements Standard Types Allowed for Item P-610

Standard	Types Allowed
ASTM C150	I, IA, II, IIA, III, IIIA; V
ASTM C595	Type IP, IP-A, IS, IS-A, IL
ASTM C1157	Types GU, HS, MH.

Other cements may be specified with concurrence of the FAA.

The chemical requirements for all cement types specified should meet suitable criteria for deleterious activity. Low alkali cements (less than 0.6% equivalent alkalies.

Total Alkalies (Na2O and K2O) of the cement secured for the production of concrete shall be independently verified in accordance with ASTM C114 or ASTM C1365.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751 or ASTM D1752.

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall conform to the requirements presented in the below table.

Steel Reinforcement

Reinforcing Steel	ASTM A615, ASTM A706, ASTM A775, ASTM A934
Welded Steel Wire Fabric	ASTM A1064, ASTM A884
Welded Deformed Steel Fabric	ASTM A1064
Bar Mats	ASTM A184 or ASTM A704

610-2.11 Materials for curing concrete. Curing materials shall conform to: White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B, ASTM C309.

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 here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard. The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

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 the RPRs approval. If approval 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 his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown 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 surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water

or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. 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.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F, follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85°F, follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The Contractor will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; **test air content in accordance with ASTM C231**; make and cure compressive strength specimens in accordance

with ASTM C31; and test in accordance with ASTM C39. The QC testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 *Concrete and its reinforcement shall be* ***considered incidental to those contract items requiring concrete and no separate measurement shall be made*** *of concrete complete in place and accepted.*

BASIS OF PAYMENT

610-6.1 *Concrete used for contract bid items, either non-reinforced or reinforced, shall not be measured separately for payment. The cost of concrete, either non-reinforced or reinforced, shall be included in the various contract bid items requiring concrete.*

REFERENCES

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

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates

ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis

ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

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. Certified test reports greater than four months old will not be accepted. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
Waterborne – Type III	White (Permanent)	37925	90 ft^2/gal	III	8 lb/gal
Temporary Marking Waterborne – Type II	White (Temporary)	37925	230 ft^2/gal	No Beads	No Beads
Waterborne – Type III	Black (Permanent)	37038	55 ft^2/gal	No Beads	No Beads
Waterborne – Type III	Yellow (Permanent)	33538 or 33655	90 ft^2/gal	III	8 lb/gal
Temporary Marking Waterborne – Type II	Yellow (Temporary)	33538 or 33655	230 ft^2/gal	No Beads	No Beads
Waterborne – Type III	Red (Permanent)	31136	55 ft^2/gal	IV – Gradation A	5 lb/gal

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type III for permanent markings and Type II for Temporary Markings. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis. *The acrylic resin used for Type III shall be 100% cross linking acrylic as evidenced by infrared peaks at wavelengths 1568, 1624, and 1672 cm-l with intensities equal to those produced by an acrylic resin known to be 100% cross linking.*

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type III.

Glass beads for red and pink paint shall meet the requirements for Type IV, Gradation A.

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black and green paint.

Type III glass beads shall not be used in red and pink paint.

620-2.3 Microbicide. *All Waterborne paint shall contain microbicide that provides microbial efficacy for a period of no less than three (3) years. The microbicide shall be blended homogeneously with*

the paint under high-speed dispersion during production by the supplier/manufacturer. The final homogeneous blend of microbicide treated paint shall conform to the same viscosity stability standards as specified in TT-P-1952F.

a. *Dow (Formerly Rohm and Hass) Rocima 63 microbicide (or other approved equivalent) shall be added at a rate of 10 pounds per 100 gallons of paint.*

b. *Other products may be available that meet or exceed these specifications.*

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

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 or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads 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 marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

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. ~~The locations of markings to receive silica sand shall be shown on the plans.~~

620-3.5 Application. A period of 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. 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 has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings. *Preformed thermoplastic pavement markings not used.*

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3

readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux	
	White	Yellow
Initial Type I	300	175
Initial Type III	600	300
Initial Thermoplastic	225	100
All materials, remark when less than[1]	100	75

[1] Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a *The quantity of surface preparation for each type of surface preparation specified in paragraph 620-3.3 shall not be measured for payment. This work is considered incidental to the application of the paint.*

620-4.1b *The quantity of markings to be paid for shall be measured by the number of square feet of painting in place and accepted by the RPR.*

620-4.1c *Reflective media shall not be measured for payment. This material is considered incidental to the application of paint requiring reflective media.*

620-4.1d *The quantity of temporary markings to be paid for shall be the number of square feet of painting performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking.*

620-4.1e *The quantity of pavement marking removal to be paid for shall be measured by the number of square feet of marking removal in place and accepted by the RPR.*

620-4.1f *The quantity of surface painted guidance signs to be paid for shall be measured by each sign in place and accepted by the RPR.*

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.1a Payment for markings shall be made at the contract price for the number of square feet for each type of marking measured in place and accepted by the RPR.

620-5.1b Payment for temporary markings shall be made at the contract price for the number of square feet of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-5.01	Pavement Marking, White, Reflective, Full Rate Application, with Microbicide - per square foot
Item P-620-5.02	Pavement Marking, Yellow, Non-Reflective, Half Rate Application - per square foot
Item P-620-5.03	Pavement Marking, Yellow, Reflective, Full Rate Application, with Microbicide - per square foot
Item P-620-5.04	Pavement Marking, Black, Non-Reflective, Full Rate Application - per square foot
Item P-620-5.05	Pavement Marking Removal - per square foot

REFERENCES

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

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer

ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24	Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings
29 CFR Part 1910.1200	Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D	Beads (Glass Spheres) Retro-Reflective
FED SPEC TT-P-1952F	Paint, Traffic and Airfield Marking, Waterborne
FED STD 595	Colors used in Government Procurement

Commercial Item Description

A-A-2886B	Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1	Standards for Airport Markings
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

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Item T-901 Seeding

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding, fertilizing and liming the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 Seed. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Seed Properties and Rate of Application

Seed	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application lb/acre (or lb/1,000 S.F.)
Common Bermuda Grass (Hulled)	90	70	10
Interstate Lespedeza	90	70	75

Seeding for Common Bermuda Grass shall be performed during the period between April 16th and August 31st inclusive; seeding for Interstate Lespedeza shall be performed during the period between September 1st and February 28th; unless otherwise approved by the RPR.

901-2.2 Lime. *Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 (850 µm) mesh sieve and 50% will pass through a No. 100 (150 µm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high*

magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of 400 lbs./acre. All liming materials shall conform to the requirements of ASTM C602.

901-2.3 Fertilizer. *Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified, and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.*

The fertilizers may be supplied in one of the following forms:

a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;

b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or

c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be 19-19-19 commercial fertilizer and shall be spread at the rate of 400 lbs./acre

901-2.4 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

901-3.1 Advance preparation and cleanup. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 Dry application method.

a. Liming. Lime shall be applied separately and prior to the application of any fertilizer or seed and only on seedbeds that have previously been prepared as described above. The lime shall then be worked into the top 3 inches (75 mm) of soil after which the seedbed shall again be properly graded and dressed to a smooth finish.

b. Fertilizing. Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

901-3.3 Wet application method.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. The Contractor shall identify to the RPR all sources of water at least two (2) weeks prior to use. The RPR may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the RPR following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the RPR, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 Maintenance of seeded areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the RPR. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the RPR. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

METHOD OF MEASUREMENT

901-4.1 The quantity of seeding to be paid for shall be the number of units acre (sq m) measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

901-5.1 Payment shall be made at the contract unit price per acre (sq m) or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item T-901-5.01 Seeding - per Acre

References

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

ASTM International (ASTM)

ASTM C602 Standard Specification for Agricultural Liming Materials

Federal Specifications (FED SPEC)

FED SPEC JJJ-S-181, Federal Specification, Seeds, Agricultural

Advisory Circulars (AC)

AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-901

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Item T-905 Topsoil

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 RPR.

MATERIALS

905-2.1 Topsoil. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches (50 mm) or more in diameter), and clay lumps or similar objects. Brush and other vegetation that will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sod and herbaceous growth such as grass and weeds are not to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means, shall be removed. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh (75 μm) sieve as determined by the wash test in accordance with ASTM C117.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

905-2.2 Inspection and tests. Within 10 days following acceptance of the bid, the RPR shall be notified of the source of topsoil to be furnished by the Contractor. The topsoil shall be inspected to determine if the selected soil meets the requirements specified and to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths, for testing purposes as specified in paragraph 905-2.1.

CONSTRUCTION METHODS

905-3.1 General. Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the RPR before the various operations are started.

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) 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. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

905-3.3 Obtaining topsoil. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the RPR. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site, the Contractor shall remove this material from the designated areas and to the depth as directed by the RPR. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the RPR. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoil purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

~~When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the RPR. The Contractor shall notify the RPR sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.~~

905-3.4 Placing topsoil. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 2 inches (50 mm) after compaction, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

After spreading, any large, stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks (2 inches (50 mm) or more in diameter), roots, litter, or any foreign matter shall be raked up and disposed of by the Contractor. after spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the RPR. The compacted topsoil surface shall conform to the required lines, grades, and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

METHOD OF MEASUREMENT

905-4.1 The quantity of topsoil shall be paid by the number of cubic yards, measured in place, complete. The measurement can be stripped and the immediately placed or if it is stripped, stockpiled, and then rehandled at a later date.

BASIS OF PAYMENT

905-5.1 Payment quantity shall be made at the contract unit price per cubic yard, for the pay item listed below, in its final position. This price and payment shall be full compensation for raking/cleaning and disposal of limbs, roots, rubbish, and debris prior to stripping the topsoil; furnishing and placing all materials, and for all preparation, stockpiling and rehandling, placing and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete and work prescribed in this item.

Payment will be made under:

Item T-905-5.01 Topsoil (Obtained on Site or Removed from Stockpile) – per cubic yard

REFERENCES

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

ASTM International (ASTM)

ASTM C117	Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-905

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Item T-908 Mulching

DESCRIPTION

908-1.1 This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the RPR.

MATERIALS

908-2.1 Mulch material. Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

b. Straw. Straw shall be the stalks from threshed plant residue of oats, wheat, barley, rye, or rice from which grain has been removed. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

e. Asphalt binder. Asphalt binder material shall conform to the requirements of ASTM D977, Type SS-1 or RS-1.

908-2.2 Inspection. The RPR shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the RPR and any materials brought on the site that do not meet these standards shall be rejected.

CONSTRUCTION METHODS

908-3.1 Mulching. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the RPR. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (1800 - 2700 kg per acre) to provide a loose depth of not less than 1-1/2 inches (38 cm) nor more than 3 inches (75 mm). Other organic material shall be spread at the rate directed by the RPR. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches (150 mm) or more in length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than one inch (25 mm) nor more than 2 inches (50 mm).

908-3.2 Securing mulch. The mulch shall be held in place by light discing, a very thin covering of topsoil, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the RPR. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the "peg and string" method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot (1.5-m) centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

908-3.3 Care and repair.

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the RPR, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the RPR, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the "asphalt spray" method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m), or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it. Asphalt binder material may be sprayed on the mulched slope areas from either the top or the bottom of the slope. An approved spray nozzle shall be used. The nozzle shall be operated at a distance of not less than 4 feet (1.2 m) from the surface of the mulch and uniform distribution of the asphalt material shall be required. A pump or an air compressor of adequate capacity shall be used to ensure uniform distribution of the asphalt material.

d. If the "asphalt mix" method is used, the mulch shall be applied by blowing, and the asphalt binder material shall be sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m) or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it.

METHOD OF MEASUREMENT

908-4.1 Mulching shall be measured in acres on the basis of the actual surface area acceptably mulched.

BASIS OF PAYMENT

908-5.1 Payment will be made at the contract unit price per acre for mulching. The price shall be full compensation for furnishing all materials and for placing and anchoring the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-908-5.01	Mulching - per acre

REFERENCES

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

ASTM International (ASTM)

ASTM D977	Standard Specification for Emulsified Asphalt

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-908

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Item L-108 Underground Power Cable for Airports

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the RPR. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.

EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

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 RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, *Maintenance Airport Visual Aid Facilities*, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #8 American wire gauge (AWG), L-824 Type C, 5,000 volts, non-

shielded, with cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 Type C, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type THWN-2, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, THWN-2, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet (2.54 m) long and 3/4 inch (19 mm) in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

b. The field-attached plug-in splice. Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant

that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 Flowable backfill. Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry

aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation 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 RPR or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. 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 per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor's expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing 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 conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

a. Trenching. Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:

- When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.
- Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.

The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill material may alternatively be used.

Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

(1) Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.

(2) Trenching, etc., in cable areas shall then proceed, with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair or replacement.

b. Backfilling. After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches (125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557.

Trenches 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 turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.

Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the RPR. If not shown on the plans, the warning tape shall be located 6 inches (150 mm) above the direct-buried cable or the counterpoise wire if present. A 3-6 inch (75 - 150 mm) wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches (200 mm) minimum below finished grade.

c. Restoration. Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the sodding, topsoiling, and seeding as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557. Restoration shall be considered incidental to the pay item of which it is a component part.

108-3.4 Cable markers for direct-buried cable. The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet (60 cm) square and 4-6 inch (10 - 15 cm) thick, extending approximately one inch (25 mm) above the surface. Each cable run from a line of lights and signs to the equipment vault shall be marked at approximately every 200 feet (61 m) along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word “CABLE” and directional arrows on each cable marking slab. The letters shall be approximately 4 inches (100 mm) high and 3 inches (75 mm) wide, with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.

At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word “SPLICE” on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the RPR. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or

splice markers shall be given one coat of high-visibility aviation orange paint as approved by the RPR. Furnishing and installation of cable markers is incidental to the respective cable pay item.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the RPR.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) 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 (38 mm) on each side of the joint (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) 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 (38 mm) on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer's recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch (6.4 mm) beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound

suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. The counterpoise size is as shown on the plans. The equipotential method is applicable to all airfield lighting systems; i.e. runway, taxiway, apron – touchdown zone, centerline, edge, threshold and approach lighting systems. The equipotential method is also successfully applied to provide lightning protection for power, signal and communication systems. The light bases, counterpoise, etc – all components - are bonded together and bonded to the vault power system ground loop/electrode.

Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables. The counterpoise is centered over the cable/conduit/duct to be protected.

The counterpoise conductor shall be installed no less than 8 inches (200 mm) minimum or 12 inches (300 mm) maximum above the raceway or cable to be protected, except as permitted below:

(1) The minimum counterpoise conductor height above the raceway or cable to be protected shall be permitted to be adjusted subject to coordination with the airfield lighting and pavement designs.

(2) The counterpoise conductor height above the protected raceway(s) or cable(s) shall be calculated to ensure that the raceway or cable is within a 45-degree area of protection, (45 degrees on each side of vertical creating a 90 degree angle).

The counterpoise conductor shall be bonded to each metallic light base, mounting stake, and metallic airfield lighting component.

All metallic airfield lighting components in the field circuit on the output side of the constant current regulator (CCR) or other power source shall be bonded to the airfield lighting counterpoise system.

All components rise and fall at the same potential; with no potential difference, no damaging arcing and no damaging current flow.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Equipotential Method of lightning protection.

Reference FAA STD-019E, Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment, Part 4.1.1.7.

b. Isolation. Not used.

c. Common Installation requirements. When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

When a nonmetallic light base is used, the grounding electrode shall be bonded to the metallic light fixture or metallic base plate with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.]

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be

continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M™ Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the RPR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the RPR. All such testing shall be at the sole expense of the Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The RPR shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the RPR the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 1,000 megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the RPR prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the RPR. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved "repair" procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 Trenching shall be measured by the linear feet of trench, including the excavation, backfill, and restoration, completed, measured as excavated, and accepted as satisfactory. When specified, separate measurement shall be made for trenches of various specified widths.

108-4.2 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet (meters) installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack. Cable and counterpoise slack is considered incidental to this item and is included in the Contractor's unit price. No separate measurement or payment will be made for cable or counterpoise slack.

108-4.3 No separate payment will be made for ground rods.

108-4.4 Removal of existing cables from existing duct bank or conduit shall be measured by the number of linear feet completely removed and disposed of off-site by the Contractor. Measurements for multiple cables in conduit shall not be measured for payment, all cables within one conduit shall be measured per linear foot of conduit.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or conduit, in place by

the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

Item L-108-5.01	Remove Existing Cable in Unit Duct, Conduit, or Trench – per linear foot
Item L-108-5.02	Trenching for Direct Buried Cable and Backfill in Soil – per linear foot
Item L-108-5.03	Trenching for Direct Buried Cable and Backfill in Rock – per linear foot
Item L-108-5.04	No. 8 AWG, 5 kV, L-824, Type C Cable, Installed in Duct Bank or Conduit - per liner foot
Item L-108-5.05	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed Above the Duct Bank or Conduit, Including Connections/Terminations - per linear foot (meter)
Item L-108-5.06	2#6 XLPUSE, 1#8 Gnd Installed in Trench – per linear foot
Item L-108-5.07	No. 8 AWG, 600V, Type THWN Cable Installed in Duct Bank or Conduit – per linear foot

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Federal Aviation Administration Standard

FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment

END OF ITEM L-108

Item L-109 Airport Transformer Vault and Vault Equipment

DESCRIPTION

109-1.1 This item shall consist of removing an existing airport transformer vault equipment and; constructing an airport transformer vault or a prefabricated metal housing per these specifications and per the design and dimensions shown in the plans. This work shall also include the installation of conduits in the floor and foundation, painting and lighting of the vault or metal housing, and the furnishing of all incidentals that are necessary to produce a completed unit. Included as a separate part under this item or as a separate item where an existing vault is to be used shall be the furnishing of all vault equipment, wiring, electrical buses, cable, conduit, potheads, and grounding systems. This work shall also include the painting of equipment and conduit; the marking and labeling of equipment and the labeling or tagging of wires; the testing of the installation; and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the RPR.

Removal of the existing airfield lighting vault equipment, and accessories shall become the property of the Contractor and shall be legally disposed of off-site.

EQUIPMENT AND MATERIALS

109-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be certified in AC 150/5345-53, Airport Lighting Equipment Certification Program (ALECP) and listed in the ALECP Addendum.

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 RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be provided in electronic pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

CONSTRUCTION OF VAULT AND PREFABRICATED METAL HOUSING

109-3.1 Electrical vault building. The electrical vault building must comply with NEC Article 110.31, Enclosure for Electrical Installations, Item (A) Electrical Vaults. Construct the building of materials having adequate structural strength for the conditions and installed location, has a minimum fire rating of two or three hours as determined by the authority having jurisdiction (AHJ), and is bullet resistant to minimum UL 752 Level 4.

109-3.2 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

109-3.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

109-3.4 Reinforcing steel. Reinforcing steel bars shall be intermediate or structural grade deformed-type bars and shall be per ASTM A615.

109-3.5 Brick. Brick shall be per ASTM C62, Grade SW.

109-3.6 Rigid steel conduit. Rigid steel conduit and fittings shall be per Underwriters Laboratories Standards 6 and 514B.

109-3.7 Plastic Conduit and fittings. Plastic Conduit and fittings shall conform to the requirements of UL-651 and UL-654 schedule 40 polyvinyl chloride (PVC) suitable for use above or below ground.

109-3.8 Lighting. Vault or metal-housing light fixtures shall be of a vapor-proof type.

109-3.9 Outlets. Convenience outlets shall be heavy-duty duplex units designed for industrial service.

109-3.10 Switches. Vault or metal-housing light switches shall be single-pole switches.

109-3.11 Paint.

a. Priming paint for non-galvanized metal surfaces shall be a high solids alkyd primer compatible with the manufacturer's recommendations for the intermediate or topcoat.

b. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to the Master Painter's Institute (MPI), Reference #9, Exterior Alkyd, Gloss.

c. Priming paint for wood surfaces shall be mixed on the job by thinning the specified white paint by adding 1/2 pint (0.24 liter) of raw linseed oil to each gallon (liter).

d. Paint for the floor, ceiling, and inside walls shall be per Porter Paint Company 69, 71, and 79 or equivalent. Walls and ceiling shall be light gray and the floor shall be medium gray.

e. The roof coating shall be hot asphalt material per ASTM D2823. Asbestos-free roof coating per ASTM D4479 may be substituted if required by local codes.

109-3.12 Ground bus. Ground bus shall be 1/8 × 3/4 inch (3 × 19 mm) minimum copper bus bar.

109-3.13 Square duct. Duct shall be square similar to that manufactured by the Square D Company (or equivalent), or the Trumbull Electric Manufacturing Company (or equivalent). The entire front of the duct on each section shall consist of hinged or removable cover for ready access to the interior. The cross-section of the duct shall be not less than 4 × 4 inch (100 × 100 mm) except where otherwise shown in the plans.

109-3.14 Ground rods. Ground rods shall be in accordance with Item L-108.

109-3.15 Vault prefabricated metal housing. The prefabricated metal housing shall be a commercially available unit.

109-3.16 FAA-approved equipment. Certain items of airport lighting equipment installed in vaults are covered by individual ACs listed below:

AC 150/5345-3	Specification for L-821, Panels for Remote Control of Airport Lighting

AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-13	Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits.
AC 150/5345-49	Specification for L-854, Radio Control Equipment
AC 150/5345-56	Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS)

109-3.17 Other electrical equipment. Distribution transformers, oil switches, cutouts, relays, terminal blocks, transfer relays, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications and ACs shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers (IEEE) or the National Electrical Manufacturers Association (NEMA). When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans. Equipment selected and installed by the Contractor shall maintain the interrupting current rating of the existing systems or specified rating whichever is greater.

109-3.18 Wire. Wire (in conduit) rated up to 5,000 volts shall be per AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits. For ratings up to 600 volts, moisture and heat resistant thermoplastic wire conforming to Commercial Item Description A-A-59544A Type THWN-2 shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

a. Control circuits. Unless otherwise indicated on the plans, wire shall be not less than No. 12 American wire gauge (AWG) and shall be insulated for 600 volts. If telephone control cable is specified, No. 19 AWG telephone cable per ANSI/Insulated Cable Engineers Association (ICEA) S-85-625 specifications shall be used.

b. Power circuits.

(1) 600 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 600 volts.

(2) 3,000 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 3,000 volts.

(3) Over 3,000 volts-Wire shall be No. 6 AWG or larger and insulated for at least the circuit voltage.

109-3.19 Short circuit / coordination / device evaluation / arc flash analysis. The Contractor shall, based upon the equipment provided, include as a part of the submittal process the electrical system "Short Circuit / Coordination / Device evaluation / Arc Flash Analysis". The analysis shall be performed by the equipment manufacturer and submitted in a written report. The analysis shall be signed and sealed by a registered professional Engineer from the state in which the project is located. The analysis shall comply with NFPA-70E and IEEE 1584.

The analysis will include: one line diagrams, short circuit analysis, coordination analysis, equipment evaluation, arc flash analysis and arc flash labels containing at a minimum, equipment name, voltage/current rating, available incident energy and flash protection boundary.

The selected firms field service Engineer shall perform data gathering for analysis completion and device settings, perform device setting as recommended by the analysis and will furnish and install the arc flash labels. The components worst case incident energy will be considered the available arc flash energy at that specific point in the system. Submit three written copies and one electronic copy of the report.

CONSTRUCTION METHODS

CONSTRUCTION OF VAULT AND PREFABRICATED METAL HOUSING

109-4.1 General. The Contractor shall construct the transformer vault or prefabricated metal housing at the location indicated in the plans. Vault construction shall be reinforced concrete, concrete masonry, or brick wall as specified. The metal housing shall be prefabricated equipment enclosure to be supplied in the size specified. The mounting pad or floor details, installation methods, and equipment placement are shown in the plans. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program.

The Contractor shall clear, grade, and seed the area around the vault or metal housing for a minimum distance of 10 feet (3 m) on all sides. The slope shall be not less than 1/2 inch per foot (12 mm per 0.3 m) away from the vault or metal housing in all directions.

The vault shall provide adequate protection against weather elements, including rain, wind-driven dust, snow, ice and excessive heat. The vault shall have sufficient filtered ventilation, to assure that the interior room temperatures and conditions do not exceed the recommended limits of the electrical equipment to be installed in the vault. The Contractor is responsible for contacting the manufacturer of the equipment to be installed to obtain environmental limitations of the equipment to be installed. Refer to the electrical vault detail plan sheets for construction requirements. The prefabricated building shall include roof, walls and floor in accordance with the details and these specifications.

109-4.2 Foundation and walls.

a. Reinforced concrete construction. The Contractor shall construct the foundation and walls per the details shown in the plans. Unless otherwise specified, internal ties shall be of the mechanical type so that when the forms are removed the ends of the ties shall be at least one inch (25 mm) beneath the concrete surface; the holes shall be plugged and finished to prevent discoloration. Reinforcing steel shall be placed, as shown in the drawings, and secured in position to prevent displacement during the concrete placement.

The external surfaces of the concrete shall be thoroughly worked during the placing operation to force all coarse aggregate from the surface. Thoroughly work the mortar against the forms to produce a smooth finish free from air pockets and honeycomb.

The surface film of all pointed surfaces shall be removed before setting occurs. As soon as the pointing has set sufficiently, the entire surface inside and outside of the vault shall be thoroughly wet with water and rubbed with a No. 16 carborundum stone, or equivalent quality abrasive, bringing the surface to a paste. All form marks and projections shall be removed. The surface produced shall be smooth and dense without pits or irregularities. The materials which have been ground into a paste during the rubbing process shall be spread or brushed uniformly over the entire surface (except the interior surfaces that are to be painted shall have all paste removed by washing before painting) and permitted to reset. Final exterior finish shall be obtained by rubbing with No. 30 carborundum stone, or an equivalent quality abrasive. The surface shall be rubbed until the entire surface is smooth and uniform in color.

b. Brick and concrete construction. When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The outer edge of the foundation at the floor level shall be beveled 1-1/2 inches (38 mm) at 45 degrees. Brick walls shall be 8 inches (200 mm) thick, laid in running bond with every sixth course a header course. Brick shall be laid in cement mortar (one part masonry cement and 3 parts sand) with full mortar bed and shoved joints. All joints shall be completely filled with mortar, and facing brick shall be back-parged with mortar as work progresses. All joints shall be 3/8 inch (9 mm) thick, exterior joints tooled concave, and interior joints struck flush. Both interior and exterior brick surfaces shall be cleaned and nail holes, cracks and other defects filled with mortar. When specified, a nonfading mineral pigment mortar coloring shall be added to the mortar. Steel reinforcing bars, 3/8 inch (9 mm) in diameter and 12 inches (300 mm) long, shall be set vertically in the center of the brick wall on not more than 2 feet (60 cm) centers to project 2-1/2 inches (60 mm) into the concrete roof slab. Lintels for supporting the brickwork over

doors, windows, and louvers shall consist of two 4 × 3 × 3/8 inch (100 × 75 × 9 mm) steel angles. Lintels shall be painted with one coat of corrosion-inhibiting primer before installation, and all exposed parts shall be painted similar to doors and window sash after installation.

Window sills may be concrete poured in place or precast concrete as indicated in the plans. All exposed surfaces shall have a rubbed finish as specified under reinforced concrete construction. After completion, all interior and exterior faces of walls shall be scrubbed with a solution of muriatic acid and water in the proportions of not less than one part acid to 10 parts of water. All traces of efflorescence, loose mortar, and mortar stain shall be removed, and the walls washed down with clear water.

c. Concrete masonry construction. When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The concrete masonry units shall be standard sizes and shapes and shall conform to ASTM C90 and shall include the closures, jambs, and other shapes required by the construction as shown in the plans. Standard construction practice shall be followed for this type of work including mortar, joints, reinforcing steel for extensions into roof slab, etc. Plaster for interior walls, if specified, shall be Portland cement plaster.

109-4.3 Roof. The roof shall be reinforced concrete as shown in the plans. Reinforcing steel shall be placed as shown in the drawing and secured in position to prevent displacement during the pouring of the concrete. The concrete shall be poured monolithically and shall be free of honeycombs and voids. The surface shall have a steel-troweled finish and shall be sloped as shown in the drawing. The underside of the roof slab shall be finished in the same manner as specified for walls.

One brush or mop coat of hot asphalt roof coating shall be applied to the top surface of the roof slab. The asphalt material shall be heated to within the range specified by the manufacturer and immediately applied to the roof. The finished coat shall be continuous over the roof surface and free from holidays and blisters. Smears and dribbles of asphalt on the roof edges and building walls shall be removed.

109-4.4 Floor. Construct building foundation in accordance with the details shown in the plans. The floor shall be reinforced concrete as shown in the drawings. When present, all sod, roots, refuse, and other perishable material shall be removed from the area under the floor to a depth of 8 inches (200 mm), unless a greater depth is specified in the invitation for bids. This area shall be backfilled with materials consisting of sand, cinders, gravel, or stone. Fill shall be placed in layers not to exceed 4 inches (100 mm) and shall be thoroughly compacted by tamping or rolling. A layer of building paper shall be placed over the fill prior to placing concrete. The floor surfaces shall have a steel-troweled finish. The floor shall be level unless a drain is specified, in which case the floor shall be pitched 1/4 inch (6 mm) per foot downward toward the drain. A 1/4-inch (6-mm) asphalt felt expansion joint shall be placed between floor and foundation walls. The floor shall be poured monolithically and shall be free of honeycombs and voids.

109-4.5 Floor drain. If shown in the plans, a floor drain and dry well shall be installed in the center of the floor of the equipment room. The dry well shall be excavated 4 × 4 feet (1.2 × 1.2 m) square and to a depth of 4 feet (1.2 m) below the finished floor elevation and shall be backfilled to the elevation of the underside of the floor with gravel - which shall all pass a 2-inch (50 mm) mesh sieve and shall all be retained on a 1/4-inch (6.3 mm) mesh sieve. The gravel backfill shall be placed in 6 inch (150 mm) maximum layers, and the entire surface of each layer shall be tamped either with a mechanical tamper or with a hand tamper weighing not less than 25 pounds (11 kg) and having a face area of not more than 36 square inches (232 square cm) nor less than 16 square inches (103 square cm). The drain inlet shall be set flush in the concrete floor. The drain shall have a clear opening of not less than 8 inches (200 mm) in diameter.

109-4.6 Conduits in floor and foundation. Conduits shall be installed in the floor and through the foundation walls per the details shown in the plans. All underground conduit shall be painted with an asphalt compound. Conduit shall be installed with a coupling or metal conduit adapter flush with the top of the floor. All incoming conduit shall be closed with a pipe plug to prevent the entrance of foreign material during construction. Space conduit entrances shall be left closed.

109-4.7 Doors. Doors shall be metal-clad fireproof Class A (three (3) hour rated) doors conforming to requirements of the National Electrical Code (NEC) and local electrical codes. Panic bar exit hardware shall be

installed per NEC requirements. Refer to the new electrical vault detail plan sheets for construction requirements.

109-4.8 Painting. The floor, ceiling, and inside walls of concrete construction shall first be given a hardening treatment, after which the Contractor shall apply two coats of paint as specified below, except that interior face brick walls need not be painted. The hardening treatment shall consist of applying two coats of either a commercial floor hardener or a solution made by dissolving 2 pounds (0.9 kg) of magnesium fluorosilicate or zinc sulfate crystals in one gallon (liter) of water. Each coat shall be allowed to dry at least 48 hours before the next application. After the second treating coat has dried, the surfaces shall be brushed clean of all crystals and thoroughly washed with clear water. Paint for walls and ceiling shall be a light gray color approved by the RPR. The floor paint shall be a medium gray color approved by the RPR. Before painting, the surfaces shall be dry and clean. The first coat shall be thinned by adding 2/3-quart (0.63 liters) of spar varnish and 1/3-quart (0.31 liters) of turpentine to each gallon (liter) of paint. The second coat shall be applied without thinning. All doors, lintels, and windows shall be cleaned to remove any rust or foreign material and shall be given one body and one finish coat of white paint. Bare metal surfaces shall be given a prime coat of corrosion-inhibiting primer prior to the body and finish coats.

109-4.9 Lights and switches. The Contractor shall furnish and install a minimum of two duplex convenience outlets in the vault room. Where a control room is specified, at least two duplex outlets shall be installed.

INSTALLATION OF EQUIPMENT IN VAULT OR PREFABRICATED METAL HOUSING

109-5.1 General. The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to ensure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the plans. When specified, an emergency power supply and transfer switch shall be provided and installed.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and local code agency having jurisdiction. All electrical work shall comply with the NEC and local code agency having jurisdiction including the separation of under 600V work from 5,000V work."

109-5.2 Power supply equipment. Transformers, regulators, booster transformers, and other power supply equipment items shall be furnished and installed at the location shown in the plans or as directed by the RPR. The power supply equipment shall be set on steel "H" sections, "I" beams, channels, or concrete blocks to provide a minimum space of 1-1/2 inch (38 mm) between the equipment and the floor. The equipment shall be placed so as not to obstruct the oil-sampling plugs of the oil-filled units; and name-plates shall, so far as possible, not be obscured.

If specified in the plans and specifications, equipment for an alternate power source or an emergency power generator shall be furnished and installed. The alternate power supply installation shall include all equipment, accessories, an automatic changeover switch, and all necessary wiring and connections. The emergency power generator set shall be the size and type specified.

109-5.3 Switchgear and panels. Oil switches, fused cutouts, relays, transfer switches, panels, panel boards, and other similar items shall be furnished and installed at the location shown in the plans or as directed by the RPR. Wall or ceiling mounted items shall be attached to the wall or ceiling with galvanized bolts of not less than 3/8-inch (9 mm) diameter engaging metal expansion shields or anchors in masonry or concrete vaults.

109-5.4 Duct and conduit. The Contractor shall furnish and install square-type exposed metallic ducts with hinged covers for the control circuits in the vault. These shall be mounted along the walls behind all floor-mounted equipment and immediately below all wall-mounted equipment. The hinged covers shall be placed to open from the front side with the hinges at the front bottom.

Wall brackets for square ducts shall be installed at all joints 2 feet (60 cm) or more apart with intermediate brackets as specified. Conduit shall be used between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection. When the equipment is not designed for

conduit connection, conductors shall enter the square-type control duct through insulating bushings in the duct or on the conduit risers.

109-5.5 Wiring and connections. The Contractor shall make all necessary electrical connections in the vault per the wiring diagrams furnished and as directed by the RPR. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

109-5.6 Marking and labeling. All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

a. Wire identification. The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification -markings designated in the plans shall be followed. Tags, if used, shall be of fiber not less than 3/4 inch (19 mm) in diameter and not less than 1/32 inch (1 mm) thick. Identification markings designated in the plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

b. Labels. The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with white oil paint as designated by the RPR. The letters and numerals shall be not less than one inch (25 mm) in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations per the wiring diagram on the terminal marking strips, which are a part of each terminal block.

METHOD OF MEASUREMENT

109-6.1 The quantity of equipment to be paid for under this item shall consist of all equipment installed, connected and accepted as a complete unit ready for operation within an existing vault or prefabricated metal housing.

BASIS OF PAYMENT

109-7.1 Payment will be made at the contract unit price for each completed and accepted vault or prefabricated metal housing equipment installation. 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 the item.

Payment will be made under:

Item L-109-7.01	Airfield Vault Modifications – per lump sum
Item L-109-7.02	New 7.5kW Regulator, Installed, Complete (Taxiway B) – per each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-3	Specification for L-821, Panels for Remote Control of Airport Lighting
AC 150/5345-5	Circuit Selector Switch

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-13	Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits
AC 150/5345-49	Specification L-854, Radio Control Equipment;
AC 150/5345-53	Airport Lighting Equipment Certification Program

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/ICEA S-85-625	Standard for Telecommunications Cable Aircore, Polyolefin Insulated, Copper Conductor Technical Requirements

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C62	Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C90	Standard Specification for Loadbearing Concrete Masonry Units
ASTM D2823	Standard Specification for Asphalt Roof Coatings, Asbestos Containing
ASTM D4479	Standard Specification for Asphalt Roof Coatings – Asbestos-Free

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation) Institute of Electrical and Electronic Engineers (IEEE)
IEEE 1584	Guide for Performing Arc-Flash Hazard Calculations

Master Painter's Institute (MPI)

MPI Reference #9	Alkyd, Exterior, Gloss (MPI Gloss Level 6)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit – Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-70E	Standard for Electrical Safety in the Workplace
NFPA-780	Standard for the Installation of Lightning Protection Systems

END OF ITEM L-109

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits and removal of existing duct banks. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

Removal of cable shall be considered incidental to the removal of the existing conduit or duct bank. No separate measurement will be made for the quantity and type of cables within the conduit or duct bank to be removed. Where existing conduit or duct bank is to remain for reuse, the removal of the cables shall be considered incidental to the respective cable installation pay item in Item L-108. Where existing conduit is to remain and be abandoned or not used, the removal of the cables shall be considered incidental to clear existing conduit.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing

no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of

access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

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 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 (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the

spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where 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 per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where 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 per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include sodding, topsoiling, and seeding shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable. Removed cable shall become property of the Contractor and legally disposed of off-site.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet (meter) of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, 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 per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110-5.01	Concrete Encased Electrical Duct Bank, 1-2" Schedule 40 PVC - per linear foot
Item L-110-5.2	Concrete Encased Electrical Duct Bank, 2-2" Schedule 40 PVC - per linear foot
Item L-110-5.3	Concrete Encased Electrical Duct Bank, 3-2" Schedule 40 PVC - per linear foot
Item L-110-5.04	Concrete Encased Electrical Duct Bank, 4-2" Schedule 40 PVC – per linear foot
Item L-110-5.05	Non-Encased Electrical Conduit, 1-2" Schedule 40 PVC - per linear foot
Item L-110-5.06	Remove Conduit - per linear foot
Item L-110-5.07	Clear Existing Conduit - per linear foot
Item L-110-5.08	Extend Concrete Encased Electrical Duct Bank 2-2" Schedule 40 PVC – per linear foot

REFERENCES

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

Advisory Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit - Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 1242	Electrical Intermediate Metal Conduit Steel
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

END OF ITEM L-110

Item L-115 Electrical Manholes and Junction Structures

DESCRIPTION

115-1.1 This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR including removal of existing manholes and junction structures as shown on the plans.

Removal of existing handholes or junction cans shall become property of the Contractor and shall be disposed of legally off-site. The void left by the removed structure shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all 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 RPR. Where required, the RPR may direct the Contractor to add, at their own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

EQUIPMENT AND MATERIALS

115-2.1 General.

a. 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 RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

115-2.2 Concrete structures. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures. Cast-in-place concrete structures shall be as shown on the plans.

115-2.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand 100,000 lb aircraft loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

115-2.4 Junction boxes. Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel. If 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Covers shall be 3/8-inch (9-mm) thickness for L-867 and 3/4-inch (19-mm) thickness for L-868. All junction boxes shall be provided with both internal and external ground lugs.

115-2.5 Mortar. The mortar shall be composed of one part of cement and two parts of mortar sand, by volume. The cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C206. Water shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

115-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

115-2.7 Frames and covers. The frames shall conform to one of the following requirements:

a. ASTM A48 Gray iron castings

b. ASTM A47 Malleable iron castings

c. ASTM A27 Steel castings

d. ASTM A283, Grade D Structural steel for grates and frames

e. ASTM A536 Ductile iron castings

f. ASTM A897 Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of 250 psi and maximum load of 100,000 lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover 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 ASTM A123.

Each cover shall have the word “ELECTRIC” or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 Ladders. Ladders, if specified, shall be galvanized steel or as shown on the plans.

115-2.9 Reinforcing steel. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.10 Bedding/special backfill. Bedding or special backfill shall be as shown on the plans.

115-2.11 Flowable backfill. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.12 Cable trays. Cable trays shall be of plastic. Cable trays shall be located as shown on the plans.

115-2.13 Plastic conduit. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.14 Conduit terminators. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.15 Pulling-in irons. Pulling-in irons shall be manufactured with 7/8-inch (22 mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch (12 mm) diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

115-2.16 Ground rods. Ground rods shall be one piece, copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 8 feet (2.4 m) long nor less than 5/8 inch (16 mm) in diameter.

CONSTRUCTION METHODS

115-3.1 Unclassified excavation. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and 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 RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 Concrete structures. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

115-3.3 Precast unit installations. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 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 RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 Installation of ladders. Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

115-3.6 Removal of sheeting and bracing. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches (150 mm) of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

115-3.7 Backfilling. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches (150 mm) in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all 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 RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the

concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

115-3.8 Connection of duct banks. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 Grounding. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches (150 mm) above the floor. The ground rod shall be installed within one foot (30 cm) of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch (100 mm) diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot (30 cm) above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

115-3.10 Cleanup and repair. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 Restoration. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 Inspection. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 Manhole elevation adjustments. The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

115-3.14 Duct extension to existing ducts. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering:; sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing

115-4.2 Manhole elevation adjustments shall be measured by the completed unit installed, in place, completed, and accepted. Separate measurement shall not be made for the various types and sizes.

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

115-5.2 Payment shall be made at the contract unit price for manhole elevation adjustments. 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, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

Payment will be made under:

Item L-115-5.01	2-Can Junction Can Plaza, Installed, Complete - per each
Item L-115-5.02	Splice Can, Installed, Complete - per each
Item L-115-5.03	Remove or Relocate Existing Electrical Handholes, Installed, Complete - per each
Item L-115-5.04	Remove or Relocate Existing Electrical Splice Can, Installed, Complete - per each
Item L-115-5.05	Existing Electrical Junction Structure Elevation Adjustment - per each

Item L-115-5.06	3-Can Junction Can Plaza, Installed, Complete – per each

REFERENCES

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

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime

FAA Engineering Brief (EB)

EB #83	In Pavement Light Fixture Bolts

Mil Spec

MIL-P-21035 Paint High Zinc Dust Content, Galvanizing Repair

National Fire Protection Association (NFPA)

NFPA-70 National Electrical Code (NEC)

END OF ITEM L-115

Item L-125 Installation of Airport Lighting Systems

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

All LED light fixtures, with the exception of obstruction lighting (AC 150/5345-43) must be warranted by the manufacturer for a minimum of 4 years after date of installation inclusive of all electronics." Obstruction lighting warranty is set by the individual manufacturer.

EQUIPMENT AND MATERIALS

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Retroreflective markers shall be type L-853 and shall conform to the requirements of AC 150/5345-39

125-2.7 Runway and Taxiway Lights. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

Lights

Type	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
L-861T(L)	2	1	-	4	L-867B	B	L-830	24" Tall

125-2.8 Runway and Taxiway Signs. Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44.

Signs

Type	Size	Style	Class	Mode	Notes
L-858R(L)	2	3	2	2	Relocated
L-858R(L)	2	3	2	2	New
L-858Y(L)	2	3	2	2	Relocated
L-858L(L)	2	3	2	2	Relocated

125-2.9 Runway End Identifier Light (REIL). Not required.

125-2.10 Precision Approach Path Indicator (PAPI). Not required.

125-2.11 Circuit Selector Cabinet. Not used.

125-2.12 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867 or L-868, Class 1A, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.13 Isolation Transformers. Isolation Transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47.

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

125-3.5 Removal. Removal of existing lights or sign foundations shall become property of the Contractor and shall be disposed of legally off-site. The void left by the removed structure shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all 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 RPR. Where required, the RPR may direct the Contractor to add, at their own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

METHOD OF MEASUREMENT

125-4.1 Reflective markers will be measured by the number installed as completed units in place, ready for operation, and accepted by the RPR. Runway and taxiway lights will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR. Guidance signs will be measured by the number of each type and size installed as completed units, in place, ready for operation, and accepted by the RPR.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete runway or taxiway light or guidance sign, reflective marker, installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item L-125-5.01	L-861T(L) Taxiway Stake Mounted Edge Light, Installed, Complete - per each
Item L-125-5.02	L-861T(L) Taxiway Base Mounted Edge Light, Installed, Complete - per each
Item L-125-5.03	Relocate Guidance Sign, 1 Module on New Foundation, Installed, Complete - per each
Item L-125-5.04	Relocate Guidance Sign, 2 Module on New Foundation, Installed, Complete - per each

Item L-125-5.05	Relocate Guidance Sign, 3 Module on New Foundation, Installed, Complete - per each
Item L-125-5.06	New Guidance Sign, 3 Module on New Foundation, Installed, Complete – per each
Item L-125-5.07	L-853 Type II Retroreflective Marker, Installed, Complete – per each
Item L-125-5.08	Remove and Reinstall L-850C, High Intensity Runway Edge Light, In-Pavement, Installed, Complete – per each
Item L-125-5.09	Remove Elevated Light - per each
Item L-125-5.10	Remove Guidance Sign Foundation - per each
Item L-125-5.11	Remove and Replace Guidance Sign Isolation Transformer - per each
Item L-125-5.12	Upgrade Stake Mounted L-861T(L) Edge Lights to Base Mounted – per each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program

Engineering Brief (EB)

EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

Section 167—Water Quality Monitoring

167.1 General Description

This Specification establishes the Contractor's responsibility to meet the requirements of the current National Pollutant Discharge Elimination System (NPDES) Infrastructure Permit No. GAR100002 as it pertains to Part IV. Erosion, Sedimentation and Pollution Control Plan. In the case of differing requirements between this specification and the Permit, whichever is the more stringent requirement shall be adhered to.

167.1.01 Definitions

Certified Personnel— certified personnel are defined as persons who have successfully completed the appropriate certification course approved by the Georgia Soil and Water Conservation Commission. For Department projects the certified person must also have successfully completed the Department's Worksite Erosion Control Supervisor (WECS) certification course.

Water Quality Sampling – as used within this specification, the term "sampling" shall be inclusive of the acts of detecting, noting, discerning, monitoring, etc. for the purpose of gauging compliance with the NPDES General Permit GAR100002.

Qualifying Rainfall Sampling Event—as used within this specification, means that which is defined in the NPDES General Permit GAR100002, Part IV.D.6.d(3).

167.1.02 Related References

A. Standard Specifications

Section 161—Control of Soil Erosion and Sedimentation

B. Referenced Documents

NPDES Infrastructure Permit No. GAR100002 GDOT

WECS seminar.

Environmental Protection Divisions Rules and Regulations (Chapter 391-3-7) Georgia Soil

and Water Conservation Commission Certification Level IA course OCGA Sec 12-7-1 et

seq.

Erosion, Sedimentation and Pollution Control Plan (ESPCP)

167.1.03 Submittals

General Provisions 101 through 150

167.2 Materials

General Provisions 101 through 150.

167.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

167.3 Construction Requirements

167.3.01 Personnel

Use GASWCC Level IA certified and WECS certified personnel to perform all monitoring, sampling, inspections, and rainfall data collection.

Use the Contractor-designated WECS or select a prequalified consultant from the Qualified Consultant List (QCL) to perform water quality monitoring, sampling, inspections, and rainfall data collection.

The Contractor is responsible for having a copy of the current GAR100002 Permit onsite at all times.

167.3.02 Equipment

Provide equipment necessary to complete the Work or as directed by the Engineer.

167.3.03 Preparation

General Provisions 101 through 150.

167.3.04 Fabrication

General Provisions 101 through 150.

167.3.05 Construction

A. General

Perform inspections, rainfall data collection, testing of samples, and reporting the test results on the project according to the requirements in Part IV of the NPDES Infrastructure Permit and this Specification. Take samples manually or use automatic samplers, according to the GAR100002 Permit. Note that the GAR100002 Permit requires the use of manual sampling or rising stage sampling for qualifying events that occur after the first instance of the automatic sampler not being activated during a qualifying event. Analyze all samples according to the Permit, regardless of the method used to collect the samples. If samples are analyzed in the field using portable turbidimeters, the monitoring results shall state they are being used and a digital readout of NTUs is what is provided. Submit bench sheets, work sheets, etc., when using portable turbidimeters. There are no exceptions to this requirement. Perform required inspections and submit all reports required by this Specification within the time frames specified. Failure to perform the inspections within the time specified will result in the cessation of all construction activities with the exception of traffic control and erosion control. Failure to submit the required reports within the times specified will result in non-refundable deductions as specified in Subsection 161.5.01.B.

B. Water Quality Inspections

The Department will provide one copy of the required inspection forms for use and duplication. Inspection forms may change during the contract to reflect regulatory agency needs or the need of the Department. Any costs associated with the change of inspection forms shall be considered incidental. Alternate formats of the provided forms may be created, used and submitted by the Contractor provided the required content and/or data fields and verbatim certification statements from the Department's current forms are included.

The Engineer shall inspect the installation and condition of each erosion control device required by the erosion control plan within seven days after initial installation. This inspection is performed for each stage of construction when new devices are installed. The WECS shall ensure all installation deficiencies reported by the Engineer are corrected within two business days.

Ensure the inspections of the areas listed below are conducted by certified personnel and at the frequencies listed. Document all inspections on the appropriate form provided by the Department.

1. Daily (when any work is occurring):
   a. Petroleum product storage, usage and handling areas for spills or leaks from vehicles or equipment.
   b. All locations where vehicles enter/exit the site for evidence of off-site sediment tracking.

Continue these inspections until a Notice of Termination (NOT) is submitted and use the daily inspection forms.

2. Weekly and after Rainfall Events:

   Conduct inspections on these areas every seven calendar days and within twenty-four hours after the end of a rainfall event that is 0.5 in (13 mm) or greater (unless such storm ends after 5:00 PM on any Friday or any non-working Saturday, non-working Sunday or any non-working Federal holiday in which case the inspection shall be completed by the end of the next business day and/or working day, whichever occurs first):

   a. Disturbed areas not permanently stabilized
   b. Material storage areas that are exposed to precipitation or stormwater and poses a risk to discharging pollutants
   c. Structural control measures, Best Management Practices (BMPs) to ensure they are operating correctly
   d. Water quality sampling locations and equipment
   e. Discharge locations or points, e.g., outfalls and drainage structures that are accessible to determine if erosion control measures are effective in preventing significant impacts to receiving waters

Continue these inspections until all temporary BMPs are removed and a NOT is submitted and use the EC-1 Form.

3. Monthly:

   Once per month, inspect all areas where final stabilization has been completed. Look for evidence of sediments or pollutants entering the drainage system and or receiving waters. Inspect all permanent erosion control devices remaining in place to verify the maintenance status and that the devices are functioning properly. Inspect discharge locations or points, e.g. outfalls, drainage structures, that are accessible to determine if erosion control measures are effective in preventing significant impacts to receiving waters.

   Continue these inspections until the Notice of Termination is submitted and use the monthly inspection form.

When the sampling location is a receiving water, the upstream and downstream samples are taken for comparison of

C. Water Quality Sampling

NTU values. When the sampling location is an outfall, a single sample is taken to be analyzed for its absolute NTU value.

D. Reports

1. Inspection Reports:

   Summarize the results of inspections noted above in writing on the appropriate Daily, Weekly, Monthly, or EC-1 form provided by the Department and includes the following information:

   - Date(s) of inspection
   - Name of certified personnel performing inspection
   - Construction phase
   - Status of devices
   - Observations
   - Action taken in accordance with Part IV.D.4.a.(5) of the GAR100002 Permit
   - Signature of personnel performing the inspection
   - Any instance of non-compliance

   When the report does not identify any non-compliance instances, the inspection report shall contain a statement that the best management practices are in compliance with the Erosion, Sedimentation and Pollution Control Plan. (See the EC-1 form.)

   The reports shall be made and retained at the site or be readily available at a designated alternate location until the

entire site or that portion of a construction project that has been phased has undergone final

stabilization and a Notice of Termination is submitted to the Georgia Department of Natural Resources Environmental Protection Division (GAEPD). Such reports shall be readily available by the end of the second business day and/or working day and shall identify all incidents of best management practices that have not been properly installed and/or maintained as described in the plan. The inspection form certification sheet shall be signed by the project WECS and the inspector performing inspections on behalf of the WECS (if not the same person). Submit all inspection reports to the Engineer within twenty-four hours of the inspection. The Engineer will review the submitted reports to determine their accuracy. The Engineer will notify the certified personnel of any additional items that should be added to the inspection report.

Complete any items listed in the inspection report requiring routine maintenance within seventy–two (72) hours of notification or immediately during perimeter BMP failure emergencies. Deficiencies that interfere with traffic flow, safety, or downstream turbidity shall have immediate reasonable steps taken to address the deficiencies.

BMP(s) that has failed or is deficient beyond routine maintenance and has resulted in sediment deposition into waters of the State shall have immediate reasonable steps taken to address the condition, including but not limited to cleaning up any contaminated surfaces so the sediment material will not discharge in subsequent storm events. When the repair does not require a new or replacement BMP or significant repair, the BMP failure or deficiency must be corrected by the close of the next business day from the time of discovery. If the correction requires a new or replacement BMP or significant repair, the correction must be completed and operational within seven (7) days from the time of discovery. If seven (7) days is infeasible, the Contractor must document why the timeframe is infeasible and coordinate with the Engineer to schedule the correction as soon as feasible after the seven (7) day timeframe. The Department must be in agreement with the infeasibility assessment.

Assume responsibility for all costs associated with additional sampling as specified in Part IV.D.6.d.3.(c) of the NPDES GAR100002 Permit if either of these conditions arise:

- BMPs shown in the Plans are not properly installed and maintained, or
- BMPs designed by the Contractor are not properly designed, installed and maintained.

2. Sampling Reports

a. All sampling shall be performed in accordance with the requirements of the GAR100002 Permit for the locations identified in the ESPCP approved by the Department.

b. Report Requirements

Include in all reports, the following certification statement, signed by the WECS or consultant providing sampling on the project:

> "I certify under penalty of law that this report and all attachments were prepared under my direction or in accordance with a system designed to assure that certified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

When a rainfall event requires a sample to be taken, submit a report of the sampling results to the Engineer within seven working days of the date the sample was obtained. Include the following information in each report:

1) Date and time of sampling
2) Name of certified person(s) who performed the sampling and analyses.
3) Date the analyses were performed
4) Time the analyses were initiated
5) Rainfall amount on the sampling date (sampling date only)
6) References and written procedures, when available, for the analytical techniques or methods used.
7) Whether the samples were taken by automatic sampler, rising-stage sampler, or manually (grab sample)
8) The NTU of each sample, the results of the analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine the results
9) Location where each sample was taken (station number and left or right offset)
10) Identification of whether a sample is a receiving-water sample or an outfall sample
11) Project number and county
12) A clear note if a sample exceeds 1000 NTUs by writing "exceeds 1000 NTUs" prominently upon the report

c. Report Requirements with No Qualifying Rainfall Events

In the event a qualifying rainfall event does not produce a discharge to sample, or sampling is "impossible", as defined in the GAR1000002 Permit, a written justification must be included in the report as required at Part IV.D.4.a.(6) of the GAR100002 Permit.

d. Sampling Results

Provide sampling results to the Project Engineer within 48 hours of the samples being analyzed. This notification may be verbal or written. This notification does not replace the requirement to submit the formal summary to the Engineer within 7 working days of the samples being collected. The Engineer will ensure submission of the sampling report to GAEPD by the 15th of the month following the sampling results as per the GAR100002 Permit. The WECS will be held accountable for delayed delivery to the Department which results in late submissions to GAEPD resulting in enforcement actions.

3. Rainfall Data Reports:

Record the measurement of rainfall within disturbed areas that have not met final stabilization once each 24- hour period, except for non-working Saturdays, non-working Sundays and non-working Federal Holidays until a Notice of Termination is submitted. If utilizing an electronic system for rainfall data collection in lieu of a simple rain gauge, the system shall be capable of measuring rainfall within ½ mile grid increments. Project rain gauges and those used to trigger the automatic samplers are to be emptied after every rainfall event. This will prevent a cumulative effect and prevent automatic samplers from taking samples even though the rainfall event is not a qualifying event. The daily rainfall data supplied by the WECS to the Engineer will be the official rainfall data for the project for compliance with the permit.

167.3.06 Quality Acceptance

General Provisions 101 through 150.

167.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

167.4 Measurement

Water Quality Inspections in accordance with the inspection and reports sub-sections will be measured for payment by the month up to the time the Contract Time expires. Required inspections and reports after Contract Time has expired will not be measured for payment unless a time extension is granted.

Water Quality Sampling is measured per each. "Each" means each qualifying rainfall sampling event, not each sampled site.

167.4.01 Limits

General Provisions 101 through 150. Submit the monitoring summary report to the Engineer within 7 working days

167.5 Payment

Payment for Water Quality Inspections and Water Quality Sampling will be made as follows:

Water Quality Inspections will be paid at the Contract Price per month. This is full compensation for performing the requirements of the inspection section of the NPDES Permit and this Specification, any and all necessary incidentals, and providing results of inspections to the Engineer, within the time frame required by the NPDES Infrastructure Permit, and this Specification.

Water Quality Monitoring and Sampling per each qualifying rainfall sampling event is full compensation for meeting the requirements of the monitoring sections of the NPDES Permit and this Specification, obtaining samples, analyzing samples, any and all necessary incidentals, and providing results of turbidity tests to the Engineer, within the time frame required by the NPDES Infrastructure Permit, and this Specification. This item is based on the rainfall events requiring sampling as described in Part IV.D.6 of the Permit. The Department will not pay for samples taken and analyzed for rainfall events that are not qualifying events as compared to the daily rainfall data supplied by the WECS.

Payment will be made under:

Item GDOT-167-5.01	Water Quality Inspections – per month
Item GDOT-167-5.02	Water Quality Monitoring and Sampling – per each

167.5.01 Adjustments

General Provisions 101 through 150.

Section 402—Hot Mix Recycled Asphaltic Concrete

402.1 General Description

This work includes producing and placing hot mix recycled asphaltic concrete that incorporates reclaimed asphalt pavement (RAP), reclaimed asphalt shingles (RAS), virgin aggregate, hydrated lime, and neat asphalt cement.

402.1.01 Definitions

General Provisions 101 through 150.

402.1.02 Related References

A. Standard Specifications

Section 400—Hot Mix Asphaltic Concrete Construction Section

800—Coarse Aggregate

Section 828—Hot Mix Asphaltic Concrete Mixtures

B. Referenced Documents

SOP 41 *Guidelines for RAP Stockpile Approval*

402.1.03 Submittals

A. Certified Weight Tickets

Notify the Engineer before removing RAP from a stockpile that belongs to the Department. Submit to the Engineer the certified weight tickets of materials removed from the stockpile.

B. Affidavit

Submit to the laboratory an affidavit stating the sources of stockpiled materials to be used on a State project. Include the following information in the letter:

- State project number
- Location from which the material was removed
- Approximate removal dates
- Mix types removed and the estimated quantity of each type in the stockpiles
- Other available information about the stockpiled material such as percentage of local sand in the RAP

Obtain specific approval from the laboratory to use RAP or RAS stockpiles.

Adhere to Guidelines for RAP Stockpile Approval.

402.2 Materials

A. RAP Material Composition

Use RAP materials from any of the following:

- Existing roadway
- Contractor's RAP stockpile that has been approved by the Department

- Department stockpile

NOTE: The location of Department RAP material stockpiles will be given on the plans.

Do not use RAP materials that contain alluvial gravel or local sand in any mixture placed on interstate projects except for mixtures used in shoulder construction. When used in shoulder construction, limit RAP containing local sand or alluvial gravel so that the sand or gravel contributes no more than 20 percent of the total aggregate portion of the mix.

1. RAP Percentage

   For non-interstate projects, limit the percentage of RAP allowed in recycled mixes so that the overall amount of alluvial gravel does not exceed 5 percent of the total mix. The percentage of alluvial gravel, local sand, and Group I material in the RAP will be determined through petrographic analysis or available records.

2. RAP furnished to the Contractor but not used in the work remains the Contractor's property.

   RAP used in the recycled mixtures for mainline or ramps (if applicable) may make up from 0 to 40 percent of the mixture depending on the amount of RAP available, the production facilities, and whether the mixture meets the requirements in Section 828.

   The maximum ratio of RAP material to the recycled mixtures other than SMA is 20 percent for continuous mix type plants and 20 percent for batch type plants. The maximum ratio of RAP material to the recycled mixture is 15 percent for Stone Matrix Asphalt (SMA) mixes.

3. Process RAP Material

   Process RAP material to be used in the recycled mixture so that 100 percent will pass the 2 in. (50 mm) sieve. Additional crushing and sizing may be required if the RAP aggregate exceeds the maximum sieve size for the mix type as shown in Section 828. Obtain representative materials from the RAP stockpile for the mix design.

B. RAS Material

~~RAS materials are produced as a by-product of manufacturing roofing shingles and/or discarded shingle scrap from the reroofing of buildings.~~

1. ~~Limit the amount of RAS material used in the recycled mixture to no greater than 5 percent of the total mixture weight.~~
2. ~~Shred the RAS material before incorporating it into the mix to ensure that 100 percent of the shredded pieces are less than 1/2 in. (12.5 mm) in any dimension.~~
3. ~~Remove all foreign materials such as paper, roofing nails, wood, or metal flashing.~~
4. ~~Provide test results for Bulk Sample Analysis, known as Polarized Light Microscopy, if post-consumer shingles are used to certify the RAS material is free of asbestos. Test stockpiles at the rate of one test per 1000 tons (megagrams) prior to processing.~~

~~Other than as specifically stated in this Subsection, ensure that RAS material is used according to the same requirements as described for RAP material.~~

C. Asphaltic Concrete Removed from an Existing Roadway

Asphaltic concrete removed from an existing roadway becomes the Contractor's property unless specified otherwise on the plans. RAP material retained by the Department is designated on the plans, and the RAP shall be stockpiled at the location specified on the plans.

D. Local Sand and Group I Material in RAP

Use of local sand in recycled mixes is restricted as stipulated in Section 828 for the Project. However, RAP which contains local sand may be used in surface and intermediate layers of non-interstate projects so long as the RAP percentage used does not contribute more than 5% local sand to the total aggregate portion of the mix. The amount of local sand in the RAP material shall be considered when determining the percentage of local sand in the total mix.

Where Pay Items specify that Group II only aggregate is to be used, RAP which consists primarily of Group II aggregate, but contains some Group I aggregate, shall be limited such that the Group I aggregate makes up no more than 5 percent of the total aggregate portion of the mix. When a Blend I mix is specified, any Group I materials in the RAP will be considered when determining the Group I portion allowed in the total mix as specified in Subsection 828.2.A.2.

Using laboratory evaluations, the Department will determine the asphalt cement grade to be used in the recycled mixture. The

E. Asphalt Cement

asphalt cement shall meet the requirements of Section 820.

When the asphalt cement is blended with asphalt cement recovered from the RAP material and after tests on residue from thin film oven tests, the asphalt cement shall have a viscosity of 6,000 to 16,000 poises (600 to 1600 Pa) or as approved by the Engineer. Recover asphalt cement from the recycled mixture to verify that the specified viscosity is being met.

If the Engineer determines during construction that the selected asphalt cement grade is not performing satisfactorily, the Department may change the asphalt cement grade in the mixture, with no change in the Contract Unit Price.

F. Recycled Mixture

The recycled mixture shall be a homogenous mixture of RAP or RAS material, virgin aggregate, hydrated lime, and neat asphalt cement. Ensure that the mixture conforms to an approved mixture design outlined in Section 828.

402.2.01 Delivery, Storage, and Handling

Separate the stockpiles by Project sources and by Group I and Group II aggregate types. Erect a sign on each stockpile to identify the source(s).

If RAP material from different project sources becomes intermixed in a stockpile, only use those materials when approved by the laboratory.

The Department may reject by visual inspection stockpiles that are not clean and free of foreign materials.

402.3 Construction Requirements

402.3.01 Personnel

General Provisions 101 through 150.

402.3.02 Equipment

A. Hot Mix Plant

Use a hot mix plant for the recycling process with necessary modifications approved by the Engineer to process recycled material. Design, equip, and operate the plant so that the proportioning, heating, and mixing yields a uniform final mixture within the job mix formula tolerances.

B. Cold Feed Bin

Proportion the RAP or RAS material using a separate cold feed bin. Ensure that the material meets the size requirements in Subsection 402.2, *Materials*. The ratio of the RAP or RAS to virgin aggregate shall be controlled gravimetrically.

C. Electronic Belt Weighing Devices

Use electronic belt weighing devices to monitor the flow of RAP or RAS and the flow of virgin aggregate. For batch-type plants, the RAP or RAS portion of the mix may be weighed in a weigh hopper before incorporating it into the pugmill. The RAP shall be screened through a 2-inch maximum sized screen prior to crossing the cold feed weigh. Ensure the amount of RAP material incorporated into the asphalt plant does not change after this final measurement is processed by the asphalt plant computer.

D. Feeders and Conveyors

Equip plants with an interlocking system of feeders and conveyors that synchronize the RAP or RAS material flow with the virgin aggregate flow. Ensure that the electronic controls track the flow rates indicated by the belt weighing devices and develop the signal to automatically maintain the desired ratio at varying production rates. Design the RAP or RAS feeder bins, conveyor system, and auxiliary bins (if used) to prevent RAP material from segregating and sticking.

402.3.03 Preparation

General Provisions 101 through 150.

402.3.04 Fabrication

General Provisions 101 through 150.

402.3.05 Construction

Follow the requirements in Section 400 for hot mix recycled asphaltic concrete production and placement, materials, equipment, and acceptance plans except as noted or modified in this specification.

402.3.06 Quality Acceptance

The Department may require additional quality control tests to determine the RAP stockpile consistency and the RAP aggregate quality. In this case, conduct at least three extraction/gradation tests from each individual source. Ensure that aggregate meets the quality standards in Section 800.

402.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

402.4 Measurement

Recycled asphaltic concrete mixture, complete in place and accepted, is measured in tons (megagrams). The weight is determined by recorded weights if an approved recording device is used. Or, the weight is determined by weighing each loaded vehicle on an approved motor truck scale as the material is hauled to the roadway.

402.4.01 Limits

General Provisions 101 through 150.

402.5 Payment

The work performed and the materials furnished as described in this specification will be paid for at the Contract Unit Price per ton (megagram). Payment is full compensation for providing materials, hauling and necessary crushing, processing, placing, rolling and finishing the recycled mixture, and providing labor, tools, equipment, and incidentals necessary to complete the work, including hauling and stockpiling RAP or RAS material.

Payment will be made under:

Item GDOT-402-5.01 Recycled asphaltic concrete 12.5mm Superpave, group-blend, including polymer-modified bituminous materials and hydrated lime – per ton

Item GDOT-402-5.02 Recycled asphaltic concrete 19mm Superpave, group-blend, including polymer-modified bituminous materials and hydrated lime – per ton

A. Materials Produced and Placed During the Adjustment Period

An adjustment period is allowed at the start of mixing operations for each type of mix placed on the Contract. A new adjustment period shall not be granted for a change of producer, mix design or asphalt plant location. The adjustment period is provided to adjust or correct the mix and to establish the construction procedures and sequence of operations.

The adjustment period consists of the tons (megagrams) of the affected mix produced and placed on the first day of operation. If this quantity is less than 500 tons (500 Mg), the Engineer may combine the tons (megagrams) produced and placed on the first day of operation with the tons (megagrams) produced and placed on the next production day of the affected mix for the adjustment period.

The material produced and placed during the mixture adjustment period is one lot. If the mix is adjusted during this period, a new lot may be necessary, but a new adjustment period will not be permitted.

This material shall be paid for at 100 percent of the Contract Unit Price provided it meets the minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the Mixture Acceptance Schedule—Table 9 or 10.

If the material placed during the adjustment period fails to meet the above requirements, it will be paid for using the applicable acceptance schedule. However, when mixture used for leveling at a spread rate of 90 lbs./yd^2 (50 kg/m^2) or less is also used for the surface mix at a spread rate greater than 90 lbs./yd^2 (50 kg/m^2), an additional adjustment period will be allowed for compaction only. This material will be paid for at a 1.00 pay factor provided it:

- Meets the minimum requirements for a 1.00 pay factor in the Mixture Acceptance Schedule—Table 9 or 10 for both asphalt content and gradation.
- Meets the minimum requirements for a 0.90 pay factor in Table 12 of Subsection 400.5.01C, *Calculate Mean Pavement Air Voids*.

Mixture which does not meet these requirements shall be paid for using the applicable acceptance schedule.

B. Determine Lot Acceptance

Pay factor adjustments are based on control sieves and asphalt cement content. The control sieves used in the mixture acceptance schedule for the various types of mix are indicated below:

Control Sieves Used in the Mixture Acceptance Schedule	
Asphaltic concrete 25 mm Superpave	1/2 in., No. 8 (12.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 19 mm SMA	1/2 in., No. 8 (12.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 19 mm Superpave	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm Superpave	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 12.5 mm SMA	3/8 in., No. 8 (9.5 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 9.5 mm Superpave	No. 4, No. 8 (4.75 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 9.5 mm SMA	No. 4, No. 8 (4.75 mm, 2.36 mm) sieves and asphalt cement
Asphaltic concrete 4.75 mm Mix	No. 8 (2.36 mm) sieve and asphalt cement

The Department will perform the following tasks:

1. Using the Mixture Acceptance Schedule—Table 9 or 10, of Subsection 400.3.06 to determine the mean of the deviations from the job mix formula per test results per lot.
2. Determine this mean by averaging the actual numeric value of the individual deviations from the job mix formula; disregard whether the deviations are positive or negative amounts.
3. Use the Asphalt Cement Content and Aggregate Gradation of Asphalt Concrete Mixture Acceptance Schedule—

Table 9 or 10 of Subsection 400.3.06 to determine acceptance of surface mixes and the Mixture Acceptance Schedule—Table 10 of Subsection 400.3.06 to determine acceptance of subsurface mixes.

On Contracts involving 1,000 tons (1000 Mg) or less of asphaltic concrete, the mixture is accepted for 100 percent payment of the asphaltic concrete Unit Price provided it meets the following:

4. Minimum requirements for a 1.00 pay factor for asphalt cement content and a 0.90 pay factor for gradation in the applicable Mixture Acceptance Schedule—Table 9 or 10 of Subsection 400.3.06.

5. Minimum requirements for a 0.90 pay factor in Table 12 of Subsection 402.5.01.C, *Calculate Pavement Mean Air Voids*.

If the material placed on Contracts involving 1,000 tons (1000 Mg) or less of asphaltic concrete does not meet the above requirements, the material will be paid for using the applicable acceptance schedule.

C. Calculate Pavement Mean Air Voids

The Department will determine the percent of maximum air voids for each lot by dividing the pavement mean air voids by the maximum pavement mean air voids acceptable.

The Department will determine the payment for each lot by multiplying the Contract Unit Price by the adjusted pay factor shown in the following Air Voids Acceptance schedule:

TABLE 12 - AIR VOIDS ACCEPTANCE SCHEDULE

Pay Factor	Percent of Maximum Air Voids (Lot Average of Tests)	Percent of Maximum Air Voids (Lot Average all Tests) (for Reevaluations)
1.00	□100	□100
0.97	100.1 — 105	100.1 — 104
0.95	105.1 — 112	104.1— 109
0.90	112.1 — 124	109.1 — 118
0.80	124.1 — 149	118.1 — 136
0.70	149.1 —172	136.1 — 153
0.50	172.1 — 191	153.1 — 166

When the range tolerance is exceeded, the Department will apply a pay factor of 0.95 as described in Subsection 400.3.06.B.2.

D. Asphaltic Concrete for Temporary Detours

Hot mix asphaltic concrete placed on temporary detours that will not remain in place as part of the permanent pavement does not require hydrated lime. Hot mix used for this purpose is paid for at an adjusted Contract Price. The payment for this item shall cover all cost of construction, maintenance and removal of all temporary mix. Hot mix asphaltic concrete placed as temporary mix shall meet requirements established in Subsection 400.3.05.F.

Where the Contract Price of the asphaltic concrete for permanent pavement is let by the ton (megagram), the Contract Price for the asphaltic concrete placed on temporary detours is adjusted by subtracting $1.75/ton ($2.00/mg) of mix used.

Where the Contract price of the mix in the permanent pavement is based on the square yard (meter), obtain the adjusted price for the same mix used on the temporary detour by subtracting $0.09/yd^2 ($0.11/ m^2) per 1- in. (25-mm) plan depth.

Further price adjustments required in Subsection 400.3.06, *Quality Acceptance*, which are based on the appropriate

E. Determine Lot Payment

adjusted Contract Price for mix used in the temporary detour work shall apply should temporary mix be left in place. Hot mix asphalt produced as temporary mix containing no hydrated lime shall be removed and replaced with permanent mix containing hydrated lime.

Determine the lot payment as follows:

1. When one of the pay factors for a specific acceptance lot is less than 1.0, determine the payment for the lot by multiplying the Contract Unit Price by the adjusted pay factor.
2. When two or more pay factors for a specific acceptance lot are less than 1.0, determine the adjusted payment by multiplying the Contract Unit Price by the lowest pay factor.

If the mean of the deviations from the job mix formula of the tests for a sieve or asphalt cement content exceeds the tolerances established in the Mixture Acceptance Schedule—Table 9 or 10 and if the Engineer determines that the material need not be removed and replaced, the lot may be accepted at an adjusted unit price as determined by the Engineer. If the pavement mean air voids exceed the tolerances established in the Air Voids Acceptance Schedule – Table 12, remove and replace the materials at the Contractor's expense.

If the Engineer determines that the material is not acceptable to leave in place, remove and replace the materials at the Contractor's expense.

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Section 820—Asphalt Cement

820.1 General Description

This section includes the requirements for asphalt cements prepared from crude petroleum.

820.1.01 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

AASHTO R 28
AASHTO R 92
AASHTO T 44
AASHTO T 48
AASHTO T 49
AASHTO T 51
AASHTO T 53
AASHTO T 179
AASHTO T 240
AASHTO T 313
AASHTO T 314
AASHTO T 315
AASHTO T 316
AASHTO T 350
AASHTO M 332
ASTM D 7173
SOP 4
SOP 15
QPL 7
QPL 65
QPL 98
QPL 106

C. Definitions

Performance Grade (PG): Method of classifying an asphalt cement binder relative to its rated performance at different testing temperatures.

Polymer Modified Asphalt (PG 76-22 PMA): Engineered asphalt cement which incorporates Styrene-Butadiene-Styrene (SBS) or Styrene-Butadiene (SB) polymers.

Highly Modified Polymer Asphalt (PG 76E-22): Engineered asphalt cement which incorporates significantly higher levels of Styrene-Butadiene-Styrene (SBS) or Styrene-Butadiene (SB) polymers than PG 76-22 PMA.

Terminal Blended Polymer-Rubber Hybrid (PG 76-22 TBPRH): An engineered blended polymer-ground tire rubber modified hybrid asphalt cement which is fully compliant with PG binder (PG76-22 PMA) specifications. TBPRH is blended at a refinery or terminal that is approved on GDOT's QPL 7 "Georgia's List of Approved Bituminous Materials Facilities" and transported to the asphaltic concrete producer's asphalt plant in a tanker.

Asphalt Rubber Binders (PG 76-22 ARB): Engineered asphalt cement which incorporates Styrene-Butadiene-Rubber (SBR) or Ground Tire Rubber (GTR). The GTR may incorporated into the asphalt concrete mixtures via a dry method when approved by the Office of Materials and Testing.

Hot Applied Non-Tracking Bituminous Tack: A non-tracking engineered asphalt cement based bituminous tack coat material that is applied using a conventional heated distributor.

820.2 Materials

820.2.01 Asphalt Cement

A. Requirements

1. Type

Use a material homogenous and water-free and will not foam when heated to 347 °F (175 °C).

Ensure blend used to produce a specified performance grade meets the following requirements:

- Is uniform and homogeneous without separation
- Uses PG 64-22 or PG 67-22 described below for the base asphalt with the exception of PG76E-22, where a different base PG binder may be used with the approval of the Office of Materials and Testing.
- Consists of production materials not being "air-blown".
- Contains < 0.5% acid (including Polyphosphoric Acid (PPA) modification, when approved by the Office of Materials and Testing.
- Only additives or modifiers approved by the Office of Materials and Testing are to be used.

2. Grade

Use the various grades of asphalt cement meeting the requirements shown in the test requirements for Petroleum Asphalt Cements.

Add Styrene-Butadiene-Styrene (SBS) or Styrene-Butadiene (SB) to neat asphalt to produce a binder meeting requirements for PG 76-22 PMA or PG 76E-22, when specified, when roadway ADT is equal to or greater than 100,000 for Stone Matrix Asphalt (SMA) and Porous European Mix (PEM) or Open Graded Friction Course (OGFC) Mixtures. When approved by the Office of Materials and Testing, PG 76-22 TBPRH meeting all the requirements for PG 76-22 PMA and subsection 820.2.01.2, Note g, may be used when roadway ADT is equal to or greater than 100,000 ADT for SMA, PEM and OGFC mixtures.

Styrene Butadiene Rubber (SBR) or crumb rubber modified PG 76-22 are acceptable alternatives to SBS or SB modified asphalt cement at contractor's discretion, when roadway ADT is less than 100,000, provided the SBR or crumb rubber modified asphalt cement meets the tests' requirements specified in Table 8.

For SBR modified PG 64-22 or PG 67-22 to meet PG 76-22 ARB, use only SBR currently approved on QPL 65 "Georgia's List of Approved Latex Suppliers". For crumb rubber modified PG 64-22 or PG 67-22 to meet PG 76-22 ARB, use only GTR approved on QPL 106 "Georgia's List of Approved Ground Tire Rubber Suppliers" at a minimum 10% of weight of neat asphalt cement content of the asphaltic concrete mixture. Ensure Trans-Polyoctenamer is added at 4.5% of the weight of the crumb rubber to achieve better particle distribution. Other workability additives approved on QPL 98 "Georgia's List of Approved Workability Additives" may be used, provided the end product meets the specified requirements of PG 76-22 ARB. PG 76-22 ARB produced using ≥8%<10% GTR incorporating an approved GTR and workability additive combination is approved in accordance with Table 8 and Note c. Ensure the end product is homogenous and shows no

separation or coagulation. Percentage of ambient or cryogenic ground tire rubber is neat asphalt source dependent to meet specification requirements for PG 76-22 ARB.

Performance Graded Binders approved on QPL 7 "(Georgia's List of Approved Bituminous Materials)" shall conform to the following PG requirements.

SUPERPAVE BINDER TABLE 1 – HOT APPLIED NON-TRACKING BITUMINOUS TACK

Test and Method	Test Temperature	Specification	Notes
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	180 °F (82 °C)	Minimum 1.00 kPa	
Penetration, 100g, 5 sec, AASHTO T 49	77 °F (25 °C)	Maximum 25	
Softening Point (°F) AASHTO T 53		Maximum 158 °F (70 °C)	

SUPERPAVE BINDER TABLE 2 – PG 58-22

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	136 °F (58 °C)	Minimum 1.00 kPa	
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	136 °F (58 °C)	Minimum 2.20 kPa	
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	72 °F (22 °C)	Maximum 6000 kPa	
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	

SUPERPAVE BINDER TABLE 3 – PG 64-22

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	147 °F (64 °C)	Minimum 1.00 kPa	
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	147 °F (64 °C)	Minimum 2.20 kPa	
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	77 °F (25 °C)	Maximum 6000 kPa	
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	

SUPERPAVE BINDER TABLE 4 – PG 67-22

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	153 °F (67 °C)	Minimum 1.00 kPa	
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	153 °F (67 °C)	Minimum 2.20 kPa	
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	80 °F (26.5 °C)	Maximum 6000 kPa	
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	

SUPERPAVE BINDER TABLE 5 – PG 76-22 PMA

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 1.00 kPa	
Dynamic Shear, Phase Angle δ AASHTO T 315,	169 °F (76 °C)	Maximum 75°	e
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 2.20 kPa	
Multiple Stress Creep Recovery, J_{nr}, 3.2 AASHTO T 350	147 °F (64 °C)	Maximum 0.50 kPa^{-1} Maximum $J_{nr\ diff}$ = 75%	h
Multiple Stress Creep Recovery, % Recovery AASHTO M 332	147 °F (64 °C)	$\%Recovery_{3.2} > 29.37\ (J_{nr\ 3.2})^{-0.2633}$	
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	80 °F (26.5 °C)	Maximum 6000 kPa	

Test and Method	Test Temperature	Specification	Notes
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	

SUPERPAVE BINDER TABLE 6 – PG 76E-22

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 5.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 3.00 kPa	
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 5.00 kPa	
Multiple Stress Creep Recovery, J_{nr}, 3.2 AASHTO T 350	169 °F (76 °C)	Maximum 0.50 kPa^{-1} Maximum $J_{nr\ diff}$ = 75%	f, h
Multiple Stress Creep Recovery, % Recovery AASHTO M 332	169 °F (76 °C)	$\%Recovery_{3.2} \geq 90$	f
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	80 °F (26.5 °C)	Maximum 6000 kPa	

Test and Method	Test Temperature	Specification	Notes
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	

SUPERPAVE BINDER TABLE 7 – PG 76-22 TBPRH

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 1.00 kPa	
Dynamic Shear, Phase Angle δ AASHTO T 315,	169 °F (76 °C)	> 42 ≤ 75°	e
Solubility of Bituminous Materials AASHTO T 44	Standard Test 77 ±0.5 °F (25 ±0.25 °C) Re-test 100 ±0.5 °F (37.8 ±0.25 °C)	Minimum 99.0%	d
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 2.20 kPa	
Multiple Stress Creep Recovery, J_{nr}, 3.2 AASHTO T 350	147 °F (64 °C)	Maximum 0.50 kPa^{-1} Maximum $J_{nr\ diff}$ = 75%	h
Multiple Stress Creep Recovery, % Recovery	147 °F (64 °C)	$\%Recovery_{3.2} > 29.37\ (J_{nr\ 3.2})^{-0.2633}$	f

Test and Method	Test Temperature	Specification	Notes
AASHTO M 332			
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	80 °F (26.5 °C)	Maximum 6000 kPa	
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	
		m-value Minimum 0.300	
OTHER TESTS			
Polymer Separation Test ASTM D 7173	325.4 ± 9 °F (163 ±5 °C)	Maximum 18 °F (10 °C) difference between top and bottom specimens	
All PG 76-22 TBPRH Materials must meet initial evaluation requirements detailed in Note g			

SUPERPAVE BINDER TABLE 8 – PG 76-22 ARB

Test and Method	Test Temperature	Specification	Notes
Flash Point AASHTO T 48		Minimum 446 °F (230 °C)	
Rotational Viscosity AASHTO T 316	275 °F (135 °C)	Maximum 3.0 Pa-s	a, b
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 1.00 kPa	b
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240			
Mass Loss % AASHTO T 240	325 ±1.8 °F (163 ±1 °C)	Maximum 1.0	b
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	169 °F (76 °C)	Minimum 2.20 kPa	b
ROLLING THIN FILM OVEN TEST RESIDUE (RTFO) AASHTO T 240 PG76-22 ARB USING ≥ 8 < 10% GTR			
Multiple Stress Creep Recovery, J_{nr}, 3.2 AASHTO T 350	147 °F (64 °C)	Maximum 0.50 kPa^{-1} Maximum $J_{nr\ diff}$ = 75%	b, c, h

Test and Method	Test Temperature	Specification	Notes
Multiple Stress Creep Recovery, % Recovery AASHTO M 332	147 °F (64 °C)	$\%Recovery_{3.2} > 29.37\ (J_{nr\,3.2})^{-0.2633}$	b, c
PRESSURE AGING VESSEL (PAV) AASHTO R 28			
Dynamic Shear, G*/sin δ, AASHTO T 315, 10 Rad/Sec	80 °F (26.5 °C)	Maximum 6000 kPa	b
Creep Stiffness AASHTO T 313 @ 60 sec	10 °F (-12 °C)	S (Stiffness) Maximum 300 MPA	b
		m-value Minimum 0.300	
OTHER TESTS			
Polymer Separation Test ASTM D 7173	325.4 ±9 °F (163 ±5 °C)	Maximum 18 °F (10 °C) difference between top and bottom specimens	b
AASHTO T 51, 5 cm per min, cm	77 °F (25 °C)	Ductility Minimum 15 cm	b
All PG 76-22 ARB Materials must meet initial evaluation requirements detailed in Note g			

Notes:

a. The Department may waive this requirement if the supplier warrants the asphalt binder can be adequately pumped and mixed at temperatures meeting all applicable safety standards.

b. PG 64-22 or PG 67-22 modified to meet PG 76-22 ARB using crumb rubber, via dry method, will be evaluated using complete analysis for compliance with PG 76-22 ARB requirements prior to mixture production using laboratory blended materials. PG 64-22 or PG 67-22 modified to meet PG 76-22 ARB using crumb rubber via dry method, will be evaluated for compliance with original DSR testing requirements for PG 76-22 during mixture production using abson recovery in accordance with GDT 119 in compliance with AC sampling frequencies established in GSP 21 sub-section A.9.

c. AASHTO T 350 and R 92 shall be used in lieu of AASHTO 51 for PG 76-22 ARB incorporating ≥ 8 < 10% GTR in accordance with Table 8.

d. Ensure Solubility testing results performed in accordance with AASHTO T 44 are included on all Performance Graded and TBPRH binders' Certificates of Analysis (COA) submitted with annual QPL 7 documents. The Department may sample and perform Solubility testing at greater than minimum required frequencies.

e. Phase Angle testing shall be conducted in lieu of AASHTO T 350 and R 92 for all "Start-up" samples which are required when an asphalt plant has not produced mixture for more than seven (7) calendar days,

f. MSCR testing in accordance with AASHTO T 350 and R 92, shall also be conducted for all "Start-up" samples which are required when an asphalt plant has not produced mixture for more than seven (7) calendar days in addition to the standard testing requirement use.

g. All asphalt binders incorporating GTR require three (3) successful minimum one (1) year trial test sections, for that GTR Modifier and Workability Additive combination, prior to approval on QPLs 98 and 106. Additionally, all GTR Modifier and Workability Additives combinations will be approved mix type specific, requiring a minimum of one (1) acceptable test section for each mix type, prior to its use in that mix type project wide.

h. The $J_{nr\ diff}$ requirement shall not apply to asphalt binders having a $J_{nr\ 3.2}$ value of 0.5 kPa^{-1} or lower at the selected temperature.

Thoroughly blend the composite materials at the supply facility prior to being loaded into the transport vehicle if modification is required in accordance with 820.2.01. Ensure all blending procedures, formulation, and operations are approved by the Office of Materials and Testing.

3. Certification:

Provide certified test results from an approved, certified laboratory of blends for proposed PG asphalt for each specification characteristic of the asphalt cement proposed for shipment. Provide the certified results to the State Materials Engineer as required in Standard Operating Procedure (SOP 4).

The State Materials Engineer may interrupt production until test results are known in the event there is reason to suspect a sample will be outside specification limits. Mixture placed incorporating modified binders determined to not meet specification requirements may be subject to removal at the recommendation of the State Materials Engineer.

B. Materials Warranty

General Provisions 101 through 150.

Section 828—Hot Mix Asphaltic Concrete Mixtures

828.1 General Description

This specification includes the requirements for hot mix asphaltic concrete mixtures, including:

- Open-graded surface mixtures (OGFC and PEM)
- Stone Matrix Asphalt mixtures (SMA)
- Superpave mixtures
- Fine-graded (4.75 mm) mixtures

828.1.01 Definitions

The Nominal Maximum Sieve Size is one standard sieve size larger than the first sieve to retain more than ten percent of the aggregate, per AASHTO R35. Mixture types in this section are identified according to Nominal Maximum Sieve Size.

828.1.02 Related References

A. Standard Specifications

Section 400-Hot Mix Asphaltic Concrete Construction

Section 402-Hot Mix Recycled Asphaltic Concrete

Section 800–Coarse Aggregate

Section 802–Aggregates for Asphaltic Concrete

Section 819–Fiber Stabilizing Additives

Section 820–Asphalt Cement

Section 831–Admixtures

Section 882–Lime

Section 883–Mineral Filler

B. Referenced Documents

AASHTO R30

AASHTO R35

AASHTO TP 108

AASHTO T 112

AASHTO T 209

AASHTO T 245

AASHTO T 305

AASHTO T 312

AASHTO T 321

AASHTO T 324

AASHTO T 331

AASHTO T 340

SOP-2

SOP-36

GDT 1

GDT 56

GDT 63

GDT 66

GDT 114

GDT 115

GDT 123

QPL 1

QPL 2

QPL 7

QPL 26

QPL 41

QPL 77

QPL 81

828.2 Materials

A. Requirements

Use approved hot mix asphalt concrete mixtures that meet the following requirements:

1. Produce each asphalt mixture according to a Department approved Job Mix Formula and Asphalt Mix Design, see Subsection 400.1 for submittal and approval of Job Mix Formulas.
2. Ensure individual acceptance test results meet the Mixture Control Tolerances specified in the appropriate table below, Subsections 828.2.01 through 828.2.04.
3. Ensure the Engineer approves all materials used to prepare and place the mixtures before incorporating them into the Work. Use only the ingredients listed in the approved Asphalt Mix Design and Job Mix Formula. For virgin aggregates use sources meeting the requirements of Section 802 and are listed in QPL 1 or QPL 2; for mixes in which local sand is permitted, use the approved sand source identified in the mix design. For mixtures containing Reclaimed Asphalt Pavement (RAP), use only RAP from the approved stockpile identified in the mix design. Use asphalt cement meeting the requirements of Section 820, from a source listed in QPL 7.
4. Obtain approved Open-Graded Friction Course (OGFC), Porous European Mix (PEM), Stone Matrix Asphalt Mix (SMA), Superpave and 4.75 mm mix designs from a mix design laboratory certified by the Department. Ensure all SMA mix designs are designed in accordance with GDT-123 (“Determining the Design Proportions of Stone Matrix Asphalt Mixtures”). Ensure all OGFC and PEM mix designs are designed in accordance with GDT 114 “Determining Optimum Asphalt Content for Open-graded Bituminous Paving Mixtures and Sub-section 828.2.01.Ensure OGFC, PEM and SMA mix designs are verified and approved by the Department prior to use. Batched materials, and gyrated specimens where applicable, for required mix design verification are to be submitted with the initial mix design approval request. Ensure Superpave and 4.75 mm mix designs are designed in accordance with SOP-2 ("Control of Superpave Bituminous Mixture Designs") and are approved

by the Department as provided therein. Ensure all mixes are designed by a laboratory and technician certified in accordance with SOP-36, ("Certification of Laboratories and Personnel for Design of SMA and Superpave Asphalt Mixtures"). Mix Design Technicians certified to design SMA mixtures are approved to design OGFC and PEM mixtures. The Department approves submitted mix designs for compliance with specified requirements and laboratory performance test data. The contractor is responsible for the placement in accordance with Sections 400 and 402 for the GDOT approved mix designs.

Use only mixtures composed of the aggregate groups and blends indicated in the Proposal and Plans by their pay item designations, defined as follows:

TABLE 1 – AGGREGATE GROUPS

Pay Item Designation	Allowable Aggregate Groups
Group I or II	Group I, Group II, or Blend I
Group II only	Group II only
Blend I	Either 100% Group II material or a blend of Group I and Group II. Do not use Group I material for more than 60%, by weight, of the total aggregate nor more than 50%, by weight, of the coarse aggregate fraction.

5. For patching or leveling use Group I, Group II, or Blend I. Mix types for patching and leveling are specified in Subsection 400.3.03.B.
6. Include lime (hydrated lime) from an approved source and meeting the requirements of Section 882 in all paving courses except as otherwise provided in the Contract. For a list of approved sources of lime, see QPL 41.
   a. Add lime to each mixture at the rate prescribed in the approved mix design.
   b. Ensure mix designs using only virgin aggregate include lime at a minimum rate of 1.00% of the total dry aggregate weight. Ensure mix designs using RAP include lime at a minimum rate equal to 1.00% of the virgin aggregate fraction plus 0.50% of the aggregate in the RAP fraction.
   c. Add more lime or add lime plus an approved Heat-Stable Anti-Stripping Additive meeting the requirements of Section 831, if necessary to meet requirements for mixture properties, and pursuant to an approved mix design. However, the Department will not make additional payment for these materials. For a list of sources of Heat-Stable Anti-Stripping Additives, see QPL 26.
   d. Where specifically allowed in the contract and pay item on local assistance, airport, and parking lot projects, an approved Heat-Stable Anti-Stripping Additive meeting the requirements of Section 831 may be substituted for hydrated lime. Ensure the mix gradation is adjusted to replace the lime with an equivalent volume of fines passing the 0.075 mm sieve. Add Heat-Stable Anti-stripping Additive at a minimum rate of 0.5 percent of the asphalt cement portion.
7. Use performance grade PG 64-22 or PG 67-22 asphalt cement in all mix designs and mixtures except as follows:
   a. The State Materials Engineer will determine the performance grade to be used, based on Table 2 – Binders Selection Guideline for Reclaimed Asphalt Pavement (RAP) Mixtures, AASHTO M323 and laboratory testing results as required in Section 828.2.B for mixtures containing ≥ 25% equivalent binder replacement for RAP/RAS mixtures.
   b. Use only grade PG 76-22, excluding shoulder construction in the following mixes: all SMA, 12.5 mm PEM, 9.5 mm and 12.5 mm OGFC, 12.5 mm Superpave, on projects with two-way ADT greater than 25,000; and in all mixtures for which polymer-modified asphalt is specified in the pay item.

8. Use of local sand is restricted as follows:
   a. Do not place mixtures containing local sand on the traveled way of the mainline or ramps of the Interstate System. Mixtures with local sand may be used for shoulder construction on these facilities.
   b. Ensure local sand will not constitute more than 20 % of the total aggregate weight of any mix design or production mix.
   c. Subject to the above limits, 19 mm, 12.5 mm, and 9.5 mm Superpave mix designs and 4.75 mm mix designs containing local sand may be used on projects with a current ADT not exceeding 4,000 VPD providing that all performance testing meets specified requirements.
   d. 25 mm Superpave mix designs containing not more than 20 % local sand may be used on all facilities except the main line and ramps of the Interstate System.
   e. Obtain local sand for use in asphalt mixtures from a source approved by the Department.
   f. Approval of local sand sources: The Department will sample, test, and approve sources of local sand. Ensure local sand contains no more than 7.0% clay by weight and is free of foreign substances, roots, twigs, and other organic matter. Ensure sand is free of clay lumps, as determined by AASHTO T 112, and has a sand equivalent value exceeding 25%, as determined by GDT 63.

B. Fabrication

1. Design procedures: For all Superpave and 4.75 mm mixes, ensure conformance with the Superpave System for Volumetric Design (AASHTO T 312 and AASHTO R30), as adapted in SOP-2. Ensure Superpave mixes are designed at a design gyration number (N_{des}) of 65 gyrations and initial gyration number (N_{ini}) of 6 gyrations. Ensure 4.75 mm mixes, (N_{des}) are designed at 50 gyrations, and (N_{ini}) at 6 gyrations. Open-graded mix designs will be designed by the Department in accordance with GDT 114. In all cases, the procedure for measuring Maximum Specific Gravity (G_{mm}) is AASHTO T 209. In addition to gradation and volumetric analysis, ensure mix designs include the following performance tests, as applicable.
2. Performance Test:
   a. Permeability test: Ensure Superpave and Stone Matrix mix designs include testing according to GDT -1 Measurement of Water Permeability of Compacted Asphalt Paving Mixtures. Ensure specimen air voids for this test are 6.0 ±1.0 %. The average permeability of three specimens may not exceed 3.60 ft per day (125 ×10−5cm per sec).
   b. Moisture Susceptibility test: For all mixtures excluding OGFC and PEM mixtures, fabricate and test specimens in accordance with GDT 66, when required by the Office of Materials and Testing due to visible signs of stripping in laboratory fabricated or plant produced asphaltic concrete mixtures. GDT 66 may also be used to evaluate moisture damage susceptibility for virgin asphaltic concrete 4.75 mm and 9.5 mm Types I and II Superpave surface mixtures failing to meet GDOT specified Hamburg Stripping Inflection Point requirements. These mixtures must comply with Hamburg Wheel Tracking Test rutting requirements. Ensure specimen air voids for this test are 7.0 ±1.0% for all mixes excluding Stone Matrix mixes. Ensure specimen air voids for this test are 6.0 ± 1.0% for Stone Matrix mixes. For all mix types, the minimum tensile splitting ratio is 0.80, except a tensile splitting ratio of no less than 0.70 may be acceptable if all individual strength values exceed 100 psi (690 kPa). Ensure individual splitting strength of the three conditioned and three controlled samples are not less than 60 psi (415 kPa). Ensure retention of coating as determined by GDT 56 is not less than 95%.
   c. Hamburg Wheel-Tracking Test for rutting and moisture susceptibility test: Ensure mix designs of all mix types except Open-graded Surface Mixes (OGFC and PEM), and Open-graded Crack Relief Interlayer (OGI) mix, include testing in accordance with AASHTO T 324. Ensure specimen air voids for this test are 7.0 ± 1.0% for all mix types, other than SMA mixes and at a testing temperature of 50°C (122°F). Ensure specimen air voids for this test are 6.0 ±1.0 % for SMA mixtures and at a testing temperature of 50°C (122°F). Use the testing and acceptance criteria established in Table 2.

TABLE 2 – HAMBURG WHEEL TRACKING DEVICE TESTING AND ACCEPTANCE CRITERIA

Binder Performance Grade (PG)	Mix Type	Number of Passes	Maximum Rut Depth	Stripping Inflection Point
PG 64-22 and PG 67-22	4.75 mm, 9.5 mm SP Type I, and 9.5 mm SP Type II	15,000	≤ 12.5 mm	> 15,000
PG 64-22 and PG 67-22	12.5 mm SP, 19 mm SP and 25 mm SP	20,000	≤ 12.5 mm	> 20,000
PG 76-22	All Mix types	20,000	≤ 12.5 mm	> 20,000

Tested specimens shall be inspected for any visible signs of stripping and any mix design's tested specimens that fail to maintain 95% of asphalt cement coating, as described in GDT 56 section D.2.d, will be required to meet specified requirements for GDT 66 as detailed in 828.2.B.2.b.

d. Fatigue testing: The Department may verify dense-graded mix designs by fatigue testing according to AASHTO T 321 or other procedure approved by the Department.

e. Abrasion Loss of Asphaltic Mixture testing: The Department will evaluate Open-graded Friction Course, Porous European Mix and SMA Types in accordance with AASHTO TP 108. In accordance with AASHTO T 312, compact OGFC and PEM specimens using the Superpave Gyrator Compactor to a specimen height of 115 ± 5 mm and specimen air void content range specified in Sub-section 828.2.01.A. Specimen air voids for the SMA specimens shall be 6.0 % ± 1.0 % with a specimen height of 115 ± 5 mm. Bulk Specific Gravity of the compacted open-graded mixtures shall be determined using Corelok vacuum-sealing device in accordance with AASHTO T 331. Individual specimen and average of three specimens for OGFC and PEM and SMA shall be reported for mix design acceptance.

C. Acceptance

See Subsection 106.03 and Section 400. Ensure individual test results meet the Mixture Control Tolerances listed in Subsections 828.2, 828.2.01 ,828.2.02, 828.2.03, or 828.2.04, whichever applies with the following exception. Ensure field verification results for rutting susceptibility tests performed on laboratory fabricated and/or roadway cores obtained from asphalt plant produced mixtures meet specified requirements for AASHTO T 324 as detailed in Subsection 828.2.B.2.c. All GDOT approved mix designs are required to have full field mix design verifications, using plant produced mixture, sampled by the contractor and submitted to the applicable GDOT laboratory (Central or District) at a minimum of once per two years. Field mix design verification results that fail to comply with performance testing specified in Subsection 828.2.B will require a complete laboratory mix design verification, to be completed by the original mix designer, for continued use of that design. If a mix design has not been produced within two years, a full field mix design verification will be sampled by the contractor and submitted to the applicable GDOT laboratory (Central or District) on the first Lot produced thereafter. Any mix design that fails to meet performance test requirements established in Subsection 828.2.B, using laboratory fabricated specimens due to failing field mix design results, may subject that mix design to invalidation after the field mix design verification results are confirmed with a second field mix design verification. Field mix design verifications as specified in Section 402, Section 400, SOP 2 and GSP 21, are not precluded by the requirements specified herein.

D. Materials Warranty

See General Provisions 101 through 150.

828.2.01 Open-Graded Surface Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Open-Graded Surface Mixtures meet the following mixture control tolerances and mix design criteria:

Sieve Size	Mixture Control Tolerance, %	Design Gradation Limits, % Passing		
		9.5 mm OGFC	12.5 mm OGFC	12.5 mm PEM
3/4 in. (19 mm) sieve	±0.0		100*	100*
1/2 in. (12.5 mm) sieve	±6.1	100*	85-100	80-100
3/8 in. (9.5 mm) sieve	±5.6	85-100	55-75	35-60
No. 4 (4.75 mm) sieve	±5.7	20-40	15-25	10-25
No. 8 (2.36 mm) sieve	±4.6	8-15	5-15	5-10
No. 200 (75 µm) sieve	±2.0	4 - 6	3-5	2-4
Range for % AC	±0.4	6.25-7.25	6.00-7.25	5.75-7.00
Range for Mix Design Air Voids %		15 - 18	15 - 20	18 - 22
Class of stone (Section 800)		“A” only	“A” only	“A” only
Drain-down (AASHTO T305), %		<0.3	<0.3	<0.3
Abrasion Loss % (AASHT0 TP 108)		Report	Report	Report

* Mixture control tolerance is not applicable to this sieve for this mix.

1. In 12.5 mm and 9.5 mm OGFC and 12.5 mm PEM mixes, use only PG 76-22 asphalt cement (specified in Section 820).
2. Ensure all OGFC and PEM mixes include a stabilizing fiber of the type (cellulose or mineral) specified in the mix design and meeting the requirements of Section 819. Ensure the dosage rate is as specified in the mix design and sufficient to prevent drain-down exceeding the above tolerance.

B. Fabrication

See Section 400.

828.2.02 Stone Matrix Asphalt Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Stone Matrix Asphalt mixtures meet the following mixture control tolerances and mix design criteria:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		9.5 mm SMA	12.5 mm SMA	19 mm SMA
1 in. (25 mm) sieve	±0.0			100*
3/4 in. (19 mm) sieve	±7.0	100*	100*	90-100
1/2 in. (12.5 mm) sieve	±6.1	98-100**	85-100	44-70
3/8 in. (9.5 mm) sieve	±5.6	70-100	50-75	25-60
No. 4 (4.75 mm) sieve	±5.7	28-50	20-28	20-28
No. 8 (2.36) mm sieve	±4.6	15-30	16-24	15-22
No. 50 (300 µm) sieve	±3.8	10-17	10-20	10-20
No. 200 (75 µm) sieve	±2.0	8-13	8-12	8-12
Range for % AC (Note 1)	±0.4 (Note 2)	6.0-7.5	5.8-7.5	5.5-7.5
Design optimum air voids (%)		3.5 ±0.5	3.5 ±0.5	3.5 ±0.5
% aggregate voids filled with AC (VFA)		70-90	70-90	70-90
Tensile splitting ratio after freeze-thaw cycle GDT-66		≥ 80%	≥ 80%	≥ 80%
Drain-down (AASHTO T305), %		<0.3	<0.3	<0.3
Abrasion Loss % (AASHT0 TP 108)		Report	Report	Report

*Mixture control tolerance is not applicable to this sieve for this mix.

**Mixture control tolerance is ± 2.0% for this sieve for 9.5 mm SMA mixes placed at spread rates greater than 135 lb./yd^2. For 9.5 mm SMA mixes placed at spread rates of 135 lb./yd^2 or less, 100 % passing is required on this sieve.

Note 1: Range for % AC is Original Optimum AC (OOAC) at 35 gyrations (Gyratory compactor) or 50 blows (Marshall compactor) prior to Corrected Optimum AC (COAC) calculation detailed in GDT 123 (Appendix A)

Note 2: Quality Acceptance Test Results for AC content that deviate > ± 0.3% from the approved Job Mix Formula (JMF) consistently over three lots may subject the mix to a revised AC content on project JMF at the discretion of the State Materials Engineer based on statistical trend.

1. Ensure SMA mixtures are compacted at 35 gyrations with the Superpave Gyratory compactor or 50 blows with the Marshall compactor.
2. Ensure SMA mixtures contain mineral filler and fiber stabilizing additives and meet the following requirements:
   a. Asphalt cement grade PG-76-22 (specified in Section 820) is required in all SMA mixtures.
   b. Aggregates for SMA meet the requirements of Subsection 802.2.02.A.3.
   c. Use the approved mineral filler specified in the mix design and meeting the requirements of Section 883 Approved sources of mineral filler are listed in QPL 81.

   Use the approved Fiber Stabilizing Additive of the type (cellulose or mineral) specified in the mix design and meeting the requirements of Section 819. Approved sources of Fiber Stabilizing Additive are listed in QPL 77.

The dosage rate will be as specified in the mix design and sufficient to prevent drain-down exceeding the above tolerance.

B. Fabrication

See Section 400.

828.2.03 Superpave Asphalt Concrete Mixtures

A. Requirements for Superpave Mixtures (except Parking Lot Mixtures)

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Superpave Asphalt Concrete mixtures meet the following mixture control tolerances and mix design limits:

1. Gradation limits for Superpave mixtures are as follows:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing				
		9.5 mm Superpave Type I	9.5 mm Superpave Type II	12.5 mm Superpave (Note 1)	19 mm Superpave	25 mm Superpave
1½ in. (37.5 mm)						100*
1 in. (25.0 mm)	± 8.0			100*	100*	90-100
3/4 in. (19.0 mm)	±8.0**	100*	100*	98-100****	90-100	55-89**
1/2 in. (12.5 mm)	±6.0***	98-100****	98-100****	90-100	60-89***	50-70
3/8 in. (9.5 mm)	±5.6	90-100	90-100	70-89	55-75	
No. 4 (4.75 mm)	±5.6	65-85	55-75			
No. 8 (2.36 mm)	±4.6	48-55	42-47	38-46	32-36	30-36
No. 200 (75 µm)	±2.0	5.0-7.0	5.0-7.0	4.5-7.0	4.0-6.0	3.5-6.0
Range for % AC (Note 3)	± 0.4 (Note 2)	5.50-7.25	5.25-7.00	5.00-6.25	4.25-5.50	4.00-5.25

*Mixture control tolerance is not applicable to this sieve for this mix.

**Ensure mixture control tolerance is within ± 10.0% for this sieve for 25 mm Superpave.

***Ensure mixture control tolerance is within ± 8.0% for this sieve for 19 mm Superpave.

****Ensure mixture control tolerance is within ± 2.0% for this sieve for 12.5 mm and 9.5 mm mixes.

Note 1: Use PG 76-22 in 12.5 mm Superpave, excluding shoulder construction, on all projects with ADT greater than 25,000 as detailed in the Contract Pay Item.

Note 2: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 3: Range for % AC is Original Optimum AC (OOAC) at 65 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

2. Volumetric limits are as follows:

Design Parameter	Mix Type	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, (Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5% maximum
% voids filled with asphalt (VFA) at Ndes	9.5 mm Type I	Min. 72; Max. 80
	9.5 Type II and 12.5 mm	Min. 72; Max. 76
	19 mm	Min. 71; Max 76
	25 mm	Min. 69; Max 76
Fines to effective asphalt binder ratio (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	All	> 7.00
Minimum % Voids in Mineral Aggregate (VMA) Note: VMA shall be calculated using the effective specific gravity of the aggregate (Gse). See SOP-2SP.	25 mm	13.0
	19 mm	14.0
	12.5 mm	15.0
	9.5 Type I	16.0
	9.5 Type II	16.0

B. Requirements for Superpave Parking Lot Mixes (NOT FOR STANDARD HIGHWAY/STREET PAVING)

1. Surface layers for parking facilities:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		4.75 mm Mix	9.5 mm Superpave Type I	9.5 mm Superpave Type II
1 in. (25.0 mm) sieve	± 8.0			
3/4 in. (19.0 mm) sieve	±8.0**		100*	100*
1/2 in. (12.5 mm) sieve	±6.0	100*	98-100****	98-100****
3/8 in. (9.5 mm) sieve	±5.6	90-100	90-100	90-100
No. 4 (4.75 mm) sieve	±5.6	75-95	65-85	55-75
No. 8 (2.36 mm) sieve	±4.6	60-65	48-55	42-47
No. 50 (300 µm) sieve	+3.8	20-50		
No. 200 (75 µm) sieve	±2.0	4-12	5.0-7.0	5.0-7.0
Range for Total AC	+ 0.4	6.00 - 7.50	5.50 - 7.25	5.25 - 7.00

2. Subsurface layers for parking facilities:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		12.5 mm Superpave	19 mm Superpave	25 mm Superpave
				100*
1 in. (25.0 mm) sieve	± 8.0	100*	100*	90-100
3/4 in. (19.0 mm) sieve	±8.0**	98-100****	90-100	55-89**
1/2 in. (12.5 mm) sieve	±6.0***	90-100	60-89***	50-70
3/8 in. (9.5 mm) sieve	±5.6	70-89	55-75	
No. 8 (2.36 mm) sieve	±4.6	38-46	32-36	30-36
No. 200 (75 µm) sieve	±2.0	4.5-7.0	4.0-6.0	3.5-6.0
Range for Total AC	+ 0.4	5.00 - 6.25	4.25 - 5.50	4.00 - 5.25

All * and notes apply to both 828.2.03.B.1 and 828.2.03.B.2.

*Mixture control tolerance is not applicable to this sieve for this mix.

**Ensure mixture control tolerance is within ±10.0% for this sieve for 25 mm Superpave mixes.

*** Ensure mixture control tolerance is within ±8.0% for this sieve for 19 mm Superpave mixes.

****Ensure mixture control tolerance is within ±2.0% for this sieve for 12.5 mm and 9.5 mm Superpave mixes.

Note 1: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 2: Range for % AC is Original Optimum AC (OOAC) at 65 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

3. Volumetric limits for parking facilities are as follows:

Design Parameter	Mix Type	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5 % maximum
% voids filled with asphalt (VFA) at Ndes	9.5 mm Type I	Min. 72; Max. 80
	9.5 Type II and 12.5 mm	Min. 72; Max. 78
	19 and 25 mm	Min. 71; Max 76
Fines to effective asphalt binder ration (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	4.75 mm	> 6.00

Design Parameter	Mix Type	Limits
	All other types	> 7.00
Minimum % Voids in Mineral Aggregate (VMA) Note: VMA shall be calculated using the effective specific gravity of the aggregate (Gse). See SOP-2	25 mm	13.0
	19 mm	14.0
	12.5 mm	15.0
	9.5 mm Types I, II	16.0

C. Fabrication

See Section 400.

828.2.04 Fine-Graded Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure that fine-graded mixtures meet the following mixture control tolerances and design limits:

ASPHALTIC CONCRETE - 4.75 mm Mix		
Sieve Size	**Mixture Control Tolerance**	**Design Gradation Limits, % passing**
1/2 in. (12.5 mm) sieve*	±0.0	100*
3/8 in. (9.5 mm) sieve	±5.6	90-100
No. 4 (4.75 mm) sieve	±5.7	75-95
No. 8 (2.36 mm) sieve	±4.6	60-65
No. 50 (300 μm) sieve	±3.8	20-50
No. 200 (75 μm) sieve	±2.0	4-12
Range for % AC	±0.4	6.00 – 7.50
Design optimum air voids (%)		4.0 – 7.0
% Aggregate voids filled with AC		60 - 80
Minimum Film Thickness (microns)		> 6.00

* Mixture control tolerance is not applicable to this sieve for this mix.

Note 1: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 2: Range for % AC is Original Optimum AC (OOAC) at 50 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

B. Fabrication

See Section 400.

C. Acceptance

See Subsection 106.3 and Section 400. Ensure individual test results meet the Mixture Control Tolerances listed in Subsections 828.2, 828.2.01, 828.2.02, 828.2.03, 828.2.04, whichever applies.

D. Materials Warranty

See General Provisions 101 through 150.

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Section 828—Hot Mix Asphaltic Concrete Mixtures

828.1 General Description

This specification includes the requirements for hot mix asphaltic concrete mixtures, including:

- Open-graded surface mixtures (OGFC and PEM)
- Stone Matrix Asphalt mixtures (SMA)
- Superpave mixtures
- Fine-graded (4.75 mm) mixtures

828.1.01 Definitions

The Nominal Maximum Sieve Size is one standard sieve size larger than the first sieve to retain more than ten percent of the aggregate, per AASHTO R35. Mixture types in this section are identified according to Nominal Maximum Sieve Size.

828.1.02 Related References

A. Standard Specifications

Section 400-Hot Mix Asphaltic Concrete Construction

Section 402-Hot Mix Recycled Asphaltic Concrete

Section 800–Coarse Aggregate

Section 802–Aggregates for Asphaltic Concrete

Section 819–Fiber Stabilizing Additives

Section 820–Asphalt Cement

Section 831–Admixtures

Section 882–Lime

Section 883–Mineral Filler

B. Referenced Documents

AASHTO R30

AASHTO R35

AASHTO TP 108

AASHTO T 112

AASHTO T 209

AASHTO T 245

AASHTO T 305

AASHTO T 312

AASHTO T 321

AASHTO T 324

AASHTO T 331

AASHTO T 340

SOP-2

SOP-36

GDT 1

GDT 56

GDT 63

GDT 66

GDT 114

GDT 115

GDT 123

QPL 1

QPL 2

QPL 7

QPL 26

QPL 41

QPL 77

QPL 81

828.2 Materials

A. Requirements

Use approved hot mix asphalt concrete mixtures that meet the following requirements:

1. Produce each asphalt mixture according to a Department approved Job Mix Formula and Asphalt Mix Design, see Subsection 400.1 for submittal and approval of Job Mix Formulas.
2. Ensure individual acceptance test results meet the Mixture Control Tolerances specified in the appropriate table below, Subsections 828.2.01 through 828.2.04.
3. Ensure the Engineer approves all materials used to prepare and place the mixtures before incorporating them into the Work. Use only the ingredients listed in the approved Asphalt Mix Design and Job Mix Formula. For virgin aggregates use sources meeting the requirements of Section 802 and are listed in QPL 1 or QPL 2; for mixes in which local sand is permitted, use the approved sand source identified in the mix design. For mixtures containing Reclaimed Asphalt Pavement (RAP), use only RAP from the approved stockpile identified in the mix design. Use asphalt cement meeting the requirements of Section 820, from a source listed in QPL 7.
4. Obtain approved Open-Graded Friction Course (OGFC), Porous European Mix (PEM), Stone Matrix Asphalt Mix (SMA), Superpave and 4.75 mm mix designs from a mix design laboratory certified by the Department. Ensure all SMA mix designs are designed in accordance with GDT-123 (“Determining the Design Proportions of Stone Matrix Asphalt Mixtures”). Ensure all OGFC and PEM mix designs are designed in accordance with GDT 114 “Determining Optimum Asphalt Content for Open-graded Bituminous Paving Mixtures and Sub-section 828.2.01.Ensure OGFC, PEM and SMA mix designs are verified and approved by the Department prior to use. Batched materials, and gyrated specimens where applicable, for required mix design verification are to be submitted with the initial mix design approval request. Ensure Superpave and 4.75 mm mix designs are designed in accordance with SOP-2 ("Control of Superpave Bituminous Mixture Designs") and are approved

by the Department as provided therein. Ensure all mixes are designed by a laboratory and technician certified in accordance with SOP-36, ("Certification of Laboratories and Personnel for Design of SMA and Superpave Asphalt Mixtures"). Mix Design Technicians certified to design SMA mixtures are approved to design OGFC and PEM mixtures. The Department approves submitted mix designs for compliance with specified requirements and laboratory performance test data. The contractor is responsible for the placement in accordance with Sections 400 and 402 for the GDOT approved mix designs.

Use only mixtures composed of the aggregate groups and blends indicated in the Proposal and Plans by their pay item designations, defined as follows:

TABLE 1 – AGGREGATE GROUPS

Pay Item Designation	Allowable Aggregate Groups
Group I or II	Group I, Group II, or Blend I
Group II only	Group II only
Blend I	Either 100% Group II material or a blend of Group I and Group II. Do not use Group I material for more than 60%, by weight, of the total aggregate nor more than 50%, by weight, of the coarse aggregate fraction.

5. For patching or leveling use Group I, Group II, or Blend I. Mix types for patching and leveling are specified in Subsection 400.3.03.B.
6. Include lime (hydrated lime) from an approved source and meeting the requirements of Section 882 in all paving courses except as otherwise provided in the Contract. For a list of approved sources of lime, see QPL 41.
   a. Add lime to each mixture at the rate prescribed in the approved mix design.
   b. Ensure mix designs using only virgin aggregate include lime at a minimum rate of 1.00% of the total dry aggregate weight. Ensure mix designs using RAP include lime at a minimum rate equal to 1.00% of the virgin aggregate fraction plus 0.50% of the aggregate in the RAP fraction.
   c. Add more lime or add lime plus an approved Heat-Stable Anti-Stripping Additive meeting the requirements of Section 831, if necessary to meet requirements for mixture properties, and pursuant to an approved mix design. However, the Department will not make additional payment for these materials. For a list of sources of Heat-Stable Anti-Stripping Additives, see QPL 26.
   d. Where specifically allowed in the contract and pay item on local assistance, airport, and parking lot projects, an approved Heat-Stable Anti-Stripping Additive meeting the requirements of Section 831 may be substituted for hydrated lime. Ensure the mix gradation is adjusted to replace the lime with an equivalent volume of fines passing the 0.075 mm sieve. Add Heat-Stable Anti-stripping Additive at a minimum rate of 0.5 percent of the asphalt cement portion.
7. Use performance grade PG 64-22 or PG 67-22 asphalt cement in all mix designs and mixtures except as follows:
   a. The State Materials Engineer will determine the performance grade to be used, based on Table 2 – Binders Selection Guideline for Reclaimed Asphalt Pavement (RAP) Mixtures, AASHTO M323 and laboratory testing results as required in Section 828.2.B for mixtures containing ≥ 25% equivalent binder replacement for RAP/RAS mixtures.
   b. Use only grade PG 76-22, excluding shoulder construction in the following mixes: all SMA, 12.5 mm PEM, 9.5 mm and 12.5 mm OGFC, 12.5 mm Superpave, on projects with two-way ADT greater than 25,000; and in all mixtures for which polymer-modified asphalt is specified in the pay item.

8. Use of local sand is restricted as follows:
   a. Do not place mixtures containing local sand on the traveled way of the mainline or ramps of the Interstate System. Mixtures with local sand may be used for shoulder construction on these facilities.
   b. Ensure local sand will not constitute more than 20 % of the total aggregate weight of any mix design or production mix.
   c. Subject to the above limits, 19 mm, 12.5 mm, and 9.5 mm Superpave mix designs and 4.75 mm mix designs containing local sand may be used on projects with a current ADT not exceeding 4,000 VPD providing that all performance testing meets specified requirements.
   d. 25 mm Superpave mix designs containing not more than 20 % local sand may be used on all facilities except the main line and ramps of the Interstate System.
   e. Obtain local sand for use in asphalt mixtures from a source approved by the Department.
   f. Approval of local sand sources: The Department will sample, test, and approve sources of local sand. Ensure local sand contains no more than 7.0% clay by weight and is free of foreign substances, roots, twigs, and other organic matter. Ensure sand is free of clay lumps, as determined by AASHTO T 112, and has a sand equivalent value exceeding 25%, as determined by GDT 63.

B. Fabrication

1. Design procedures: For all Superpave and 4.75 mm mixes, ensure conformance with the Superpave System for Volumetric Design (AASHTO T 312 and AASHTO R30), as adapted in SOP-2. Ensure Superpave mixes are designed at a design gyration number (N_{des}) of 65 gyrations and initial gyration number (N_{ini}) of 6 gyrations. Ensure 4.75 mm mixes, (N_{des}) are designed at 50 gyrations, and (N_{ini}) at 6 gyrations. Open-graded mix designs will be designed by the Department in accordance with GDT 114. In all cases, the procedure for measuring Maximum Specific Gravity (G_{mm}) is AASHTO T 209. In addition to gradation and volumetric analysis, ensure mix designs include the following performance tests, as applicable.
2. Performance Test:
   a. Permeability test: Ensure Superpave and Stone Matrix mix designs include testing according to GDT -1 Measurement of Water Permeability of Compacted Asphalt Paving Mixtures. Ensure specimen air voids for this test are 6.0 ±1.0 %. The average permeability of three specimens may not exceed 3.60 ft per day (125 ×10−5cm per sec).
   b. Moisture Susceptibility test: For all mixtures excluding OGFC and PEM mixtures, fabricate and test specimens in accordance with GDT 66, when required by the Office of Materials and Testing due to visible signs of stripping in laboratory fabricated or plant produced asphaltic concrete mixtures. GDT 66 may also be used to evaluate moisture damage susceptibility for virgin asphaltic concrete 4.75 mm and 9.5 mm Types I and II Superpave surface mixtures failing to meet GDOT specified Hamburg Stripping Inflection Point requirements. These mixtures must comply with Hamburg Wheel Tracking Test rutting requirements. Ensure specimen air voids for this test are 7.0 ±1.0% for all mixes excluding Stone Matrix mixes. Ensure specimen air voids for this test are 6.0 ± 1.0% for Stone Matrix mixes. For all mix types, the minimum tensile splitting ratio is 0.80, except a tensile splitting ratio of no less than 0.70 may be acceptable if all individual strength values exceed 100 psi (690 kPa). Ensure individual splitting strength of the three conditioned and three controlled samples are not less than 60 psi (415 kPa). Ensure retention of coating as determined by GDT 56 is not less than 95%.
   c. Hamburg Wheel-Tracking Test for rutting and moisture susceptibility test: Ensure mix designs of all mix types except Open-graded Surface Mixes (OGFC and PEM), and Open-graded Crack Relief Interlayer (OGI) mix, include testing in accordance with AASHTO T 324. Ensure specimen air voids for this test are 7.0 ± 1.0% for all mix types, other than SMA mixes and at a testing temperature of 50°C (122°F). Ensure specimen air voids for this test are 6.0 ±1.0 % for SMA mixtures and at a testing temperature of 50°C (122°F). Use the testing and acceptance criteria established in Table 2.

TABLE 2 – HAMBURG WHEEL TRACKING DEVICE TESTING AND ACCEPTANCE CRITERIA

Binder Performance Grade (PG)	Mix Type	Number of Passes	Maximum Rut Depth	Stripping Inflection Point
PG 64-22 and PG 67-22	4.75 mm, 9.5 mm SP Type I, and 9.5 mm SP Type II	15,000	≤ 12.5 mm	> 15,000
PG 64-22 and PG 67-22	12.5 mm SP, 19 mm SP and 25 mm SP	20,000	≤ 12.5 mm	> 20,000
PG 76-22	All Mix types	20,000	≤ 12.5 mm	> 20,000

Tested specimens shall be inspected for any visible signs of stripping and any mix design's tested specimens that fail to maintain 95% of asphalt cement coating, as described in GDT 56 section D.2.d, will be required to meet specified requirements for GDT 66 as detailed in 828.2.B.2.b.

d. Fatigue testing: The Department may verify dense-graded mix designs by fatigue testing according to AASHTO T 321 or other procedure approved by the Department.

e. Abrasion Loss of Asphaltic Mixture testing: The Department will evaluate Open-graded Friction Course, Porous European Mix and SMA Types in accordance with AASHTO TP 108. In accordance with AASHTO T 312, compact OGFC and PEM specimens using the Superpave Gyrator Compactor to a specimen height of 115 ± 5 mm and specimen air void content range specified in Sub-section 828.2.01.A. Specimen air voids for the SMA specimens shall be 6.0 % ± 1.0 % with a specimen height of 115 ± 5 mm. Bulk Specific Gravity of the compacted open-graded mixtures shall be determined using Corelok vacuum-sealing device in accordance with AASHTO T 331. Individual specimen and average of three specimens for OGFC and PEM and SMA shall be reported for mix design acceptance.

C. Acceptance

See Subsection 106.03 and Section 400. Ensure individual test results meet the Mixture Control Tolerances listed in Subsections 828.2, 828.2.01 ,828.2.02, 828.2.03, or 828.2.04, whichever applies with the following exception. Ensure field verification results for rutting susceptibility tests performed on laboratory fabricated and/or roadway cores obtained from asphalt plant produced mixtures meet specified requirements for AASHTO T 324 as detailed in Subsection 828.2.B.2.c. All GDOT approved mix designs are required to have full field mix design verifications, using plant produced mixture, sampled by the contractor and submitted to the applicable GDOT laboratory (Central or District) at a minimum of once per two years. Field mix design verification results that fail to comply with performance testing specified in Subsection 828.2.B will require a complete laboratory mix design verification, to be completed by the original mix designer, for continued use of that design. If a mix design has not been produced within two years, a full field mix design verification will be sampled by the contractor and submitted to the applicable GDOT laboratory (Central or District) on the first Lot produced thereafter. Any mix design that fails to meet performance test requirements established in Subsection 828.2.B, using laboratory fabricated specimens due to failing field mix design results, may subject that mix design to invalidation after the field mix design verification results are confirmed with a second field mix design verification. Field mix design verifications as specified in Section 402, Section 400, SOP 2 and GSP 21, are not precluded by the requirements specified herein.

D. Materials Warranty

See General Provisions 101 through 150.

828.2.01 Open-Graded Surface Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Open-Graded Surface Mixtures meet the following mixture control tolerances and mix design criteria:

Sieve Size	Mixture Control Tolerance, %	Design Gradation Limits, % Passing		
		9.5 mm OGFC	12.5 mm OGFC	12.5 mm PEM
3/4 in. (19 mm) sieve	±0.0		100*	100*
1/2 in. (12.5 mm) sieve	±6.1	100*	85-100	80-100
3/8 in. (9.5 mm) sieve	±5.6	85-100	55-75	35-60
No. 4 (4.75 mm) sieve	±5.7	20-40	15-25	10-25
No. 8 (2.36 mm) sieve	±4.6	8-15	5-15	5-10
No. 200 (75 µm) sieve	±2.0	4 - 6	3-5	2-4
Range for % AC	±0.4	6.25-7.25	6.00-7.25	5.75-7.00
Range for Mix Design Air Voids %		15 - 18	15 - 20	18 - 22
Class of stone (Section 800)		“A” only	“A” only	“A” only
Drain-down (AASHTO T305), %		<0.3	<0.3	<0.3
Abrasion Loss % (AASHT0 TP 108)		Report	Report	Report

* Mixture control tolerance is not applicable to this sieve for this mix.

1. In 12.5 mm and 9.5 mm OGFC and 12.5 mm PEM mixes, use only PG 76-22 asphalt cement (specified in Section 820).
2. Ensure all OGFC and PEM mixes include a stabilizing fiber of the type (cellulose or mineral) specified in the mix design and meeting the requirements of Section 819. Ensure the dosage rate is as specified in the mix design and sufficient to prevent drain-down exceeding the above tolerance.

B. Fabrication

See Section 400.

828.2.02 Stone Matrix Asphalt Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Stone Matrix Asphalt mixtures meet the following mixture control tolerances and mix design criteria:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		9.5 mm SMA	12.5 mm SMA	19 mm SMA
1 in. (25 mm) sieve	±0.0			100*
3/4 in. (19 mm) sieve	±7.0	100*	100*	90-100
1/2 in. (12.5 mm) sieve	±6.1	98-100**	85-100	44-70
3/8 in. (9.5 mm) sieve	±5.6	70-100	50-75	25-60
No. 4 (4.75 mm) sieve	±5.7	28-50	20-28	20-28
No. 8 (2.36) mm sieve	±4.6	15-30	16-24	15-22
No. 50 (300 µm) sieve	±3.8	10-17	10-20	10-20
No. 200 (75 µm) sieve	±2.0	8-13	8-12	8-12
Range for % AC (Note 1)	±0.4 (Note 2)	6.0-7.5	5.8-7.5	5.5-7.5
Design optimum air voids (%)		3.5 ±0.5	3.5 ±0.5	3.5 ±0.5
% aggregate voids filled with AC (VFA)		70-90	70-90	70-90
Tensile splitting ratio after freeze-thaw cycle GDT-66		≥ 80%	≥ 80%	≥ 80%
Drain-down (AASHTO T305), %		<0.3	<0.3	<0.3
Abrasion Loss % (AASHT0 TP 108)		Report	Report	Report

*Mixture control tolerance is not applicable to this sieve for this mix.

**Mixture control tolerance is ± 2.0% for this sieve for 9.5 mm SMA mixes placed at spread rates greater than 135 lb./yd^2. For 9.5 mm SMA mixes placed at spread rates of 135 lb./yd^2 or less, 100 % passing is required on this sieve.

Note 1: Range for % AC is Original Optimum AC (OOAC) at 35 gyrations (Gyratory compactor) or 50 blows (Marshall compactor) prior to Corrected Optimum AC (COAC) calculation detailed in GDT 123 (Appendix A)

Note 2: Quality Acceptance Test Results for AC content that deviate > ± 0.3% from the approved Job Mix Formula (JMF) consistently over three lots may subject the mix to a revised AC content on project JMF at the discretion of the State Materials Engineer based on statistical trend.

1. Ensure SMA mixtures are compacted at 35 gyrations with the Superpave Gyratory compactor or 50 blows with the Marshall compactor.
2. Ensure SMA mixtures contain mineral filler and fiber stabilizing additives and meet the following requirements:
   a. Asphalt cement grade PG-76-22 (specified in Section 820) is required in all SMA mixtures.
   b. Aggregates for SMA meet the requirements of Subsection 802.2.02.A.3.
   c. Use the approved mineral filler specified in the mix design and meeting the requirements of Section 883 Approved sources of mineral filler are listed in QPL 81.

   Use the approved Fiber Stabilizing Additive of the type (cellulose or mineral) specified in the mix design and meeting the requirements of Section 819. Approved sources of Fiber Stabilizing Additive are listed in QPL 77.

The dosage rate will be as specified in the mix design and sufficient to prevent drain-down exceeding the above tolerance.

B. Fabrication

See Section 400.

828.2.03 Superpave Asphalt Concrete Mixtures

A. Requirements for Superpave Mixtures (except Parking Lot Mixtures)

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure Superpave Asphalt Concrete mixtures meet the following mixture control tolerances and mix design limits:

1. Gradation limits for Superpave mixtures are as follows:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing				
		9.5 mm Superpave Type I	9.5 mm Superpave Type II	12.5 mm Superpave (Note 1)	19 mm Superpave	25 mm Superpave
1½ in. (37.5 mm)						100*
1 in. (25.0 mm)	± 8.0			100*	100*	90-100
3/4 in. (19.0 mm)	±8.0**	100*	100*	98-100****	90-100	55-89**
1/2 in. (12.5 mm)	±6.0***	98-100****	98-100****	90-100	60-89***	50-70
3/8 in. (9.5 mm)	±5.6	90-100	90-100	70-89	55-75	
No. 4 (4.75 mm)	±5.6	65-85	55-75			
No. 8 (2.36 mm)	±4.6	48-55	42-47	38-46	32-36	30-36
No. 200 (75 µm)	±2.0	5.0-7.0	5.0-7.0	4.5-7.0	4.0-6.0	3.5-6.0
Range for % AC (Note 3)	± 0.4 (Note 2)	5.50-7.25	5.25-7.00	5.00-6.25	4.25-5.50	4.00-5.25

*Mixture control tolerance is not applicable to this sieve for this mix.

**Ensure mixture control tolerance is within ± 10.0% for this sieve for 25 mm Superpave.

***Ensure mixture control tolerance is within ± 8.0% for this sieve for 19 mm Superpave.

****Ensure mixture control tolerance is within ± 2.0% for this sieve for 12.5 mm and 9.5 mm mixes.

Note 1: Use PG 76-22 in 12.5 mm Superpave, excluding shoulder construction, on all projects with ADT greater than 25,000 as detailed in the Contract Pay Item.

Note 2: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 3: Range for % AC is Original Optimum AC (OOAC) at 65 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

2. Volumetric limits are as follows:

Design Parameter	Mix Type	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, (Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5% maximum
% voids filled with asphalt (VFA) at Ndes	9.5 mm Type I	Min. 72; Max. 80
	9.5 Type II and 12.5 mm	Min. 72; Max. 76
	19 mm	Min. 71; Max 76
	25 mm	Min. 69; Max 76
Fines to effective asphalt binder ratio (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	All	> 7.00
Minimum % Voids in Mineral Aggregate (VMA) Note: VMA shall be calculated using the effective specific gravity of the aggregate (Gse). See SOP-2SP.	25 mm	13.0
	19 mm	14.0
	12.5 mm	15.0
	9.5 Type I	16.0
	9.5 Type II	16.0

B. Requirements for Superpave Parking Lot Mixes (NOT FOR STANDARD HIGHWAY/STREET PAVING)

1. Surface layers for parking facilities:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		4.75 mm Mix	9.5 mm Superpave Type I	9.5 mm Superpave Type II
1 in. (25.0 mm) sieve	± 8.0			
3/4 in. (19.0 mm) sieve	±8.0**		100*	100*
1/2 in. (12.5 mm) sieve	±6.0	100*	98-100****	98-100****
3/8 in. (9.5 mm) sieve	±5.6	90-100	90-100	90-100
No. 4 (4.75 mm) sieve	±5.6	75-95	65-85	55-75
No. 8 (2.36 mm) sieve	±4.6	60-65	48-55	42-47
No. 50 (300 µm) sieve	+3.8	20-50		
No. 200 (75 µm) sieve	±2.0	4-12	5.0-7.0	5.0-7.0
Range for Total AC	+ 0.4	6.00 - 7.50	5.50 - 7.25	5.25 - 7.00

2. Subsurface layers for parking facilities:

Sieve Size	Mixture Control Tolerance	Design Gradation Limits, Percent Passing		
		12.5 mm Superpave	19 mm Superpave	25 mm Superpave
				100*
1 in. (25.0 mm) sieve	± 8.0	100*	100*	90-100
3/4 in. (19.0 mm) sieve	±8.0**	98-100****	90-100	55-89**
1/2 in. (12.5 mm) sieve	±6.0***	90-100	60-89***	50-70
3/8 in. (9.5 mm) sieve	±5.6	70-89	55-75	
No. 8 (2.36 mm) sieve	±4.6	38-46	32-36	30-36
No. 200 (75 µm) sieve	±2.0	4.5-7.0	4.0-6.0	3.5-6.0
Range for Total AC	+ 0.4	5.00 - 6.25	4.25 - 5.50	4.00 - 5.25

All * and notes apply to both 828.2.03.B.1 and 828.2.03.B.2.

*Mixture control tolerance is not applicable to this sieve for this mix.

**Ensure mixture control tolerance is within ±10.0% for this sieve for 25 mm Superpave mixes.

*** Ensure mixture control tolerance is within ±8.0% for this sieve for 19 mm Superpave mixes.

****Ensure mixture control tolerance is within ±2.0% for this sieve for 12.5 mm and 9.5 mm Superpave mixes.

Note 1: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 2: Range for % AC is Original Optimum AC (OOAC) at 65 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

3. Volumetric limits for parking facilities are as follows:

Design Parameter	Mix Type	Limits
% of Max. Specific Gravity (Gmm) at design gyrations, Ndes)	All	96%
% Gmm at the initial number of gyrations, Ni	All	91.5 % maximum
% voids filled with asphalt (VFA) at Ndes	9.5 mm Type I	Min. 72; Max. 80
	9.5 Type II and 12.5 mm	Min. 72; Max. 78
	19 and 25 mm	Min. 71; Max 76
Fines to effective asphalt binder ration (F/Pbe)	9.5 mm Type I	0.6 to 1.4
	All other types	0.8 to 1.6
Minimum Film Thickness (microns)	4.75 mm	> 6.00

Design Parameter	Mix Type	Limits
	All other types	> 7.00
Minimum % Voids in Mineral Aggregate (VMA) Note: VMA shall be calculated using the effective specific gravity of the aggregate (Gse). See SOP-2	25 mm	13.0
	19 mm	14.0
	12.5 mm	15.0
	9.5 mm Types I, II	16.0

C. Fabrication

See Section 400.

828.2.04 Fine-Graded Mixtures

A. Requirements

Produce the mixture according to an approved mix design and Job Mix Formula. Ensure that fine-graded mixtures meet the following mixture control tolerances and design limits:

ASPHALTIC CONCRETE - 4.75 mm Mix		
Sieve Size	**Mixture Control Tolerance**	**Design Gradation Limits, % passing**
1/2 in. (12.5 mm) sieve*	±0.0	100*
3/8 in. (9.5 mm) sieve	±5.6	90-100
No. 4 (4.75 mm) sieve	±5.7	75-95
No. 8 (2.36 mm) sieve	±4.6	60-65
No. 50 (300 μm) sieve	±3.8	20-50
No. 200 (75 μm) sieve	±2.0	4-12
Range for % AC	±0.4	6.00 – 7.50
Design optimum air voids (%)		4.0 – 7.0
% Aggregate voids filled with AC		60 - 80
Minimum Film Thickness (microns)		> 6.00

* Mixture control tolerance is not applicable to this sieve for this mix.

Note 1: Quality Acceptance Test Results for AC content deviating > ± 0.3 % from the approved Job Mix Formula (JMF) consistently over three Lots may subject the mix to a revised AC content on the project JMF at the discretion of the State Materials Engineer based on statistical trend.

Note 2: Range for % AC is Original Optimum AC (OOAC) at 50 gyrations prior to the Corrected Optimum AC (COAC) calculation detailed in SOP 2 (Appendix D).

B. Fabrication

See Section 400.

C. Acceptance

See Subsection 106.3 and Section 400. Ensure individual test results meet the Mixture Control Tolerances listed in Subsections 828.2, 828.2.01, 828.2.02, 828.2.03, 828.2.04, whichever applies.

D. Materials Warranty

See General Provisions 101 through 150.

APPENDIX A

SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION REPORT

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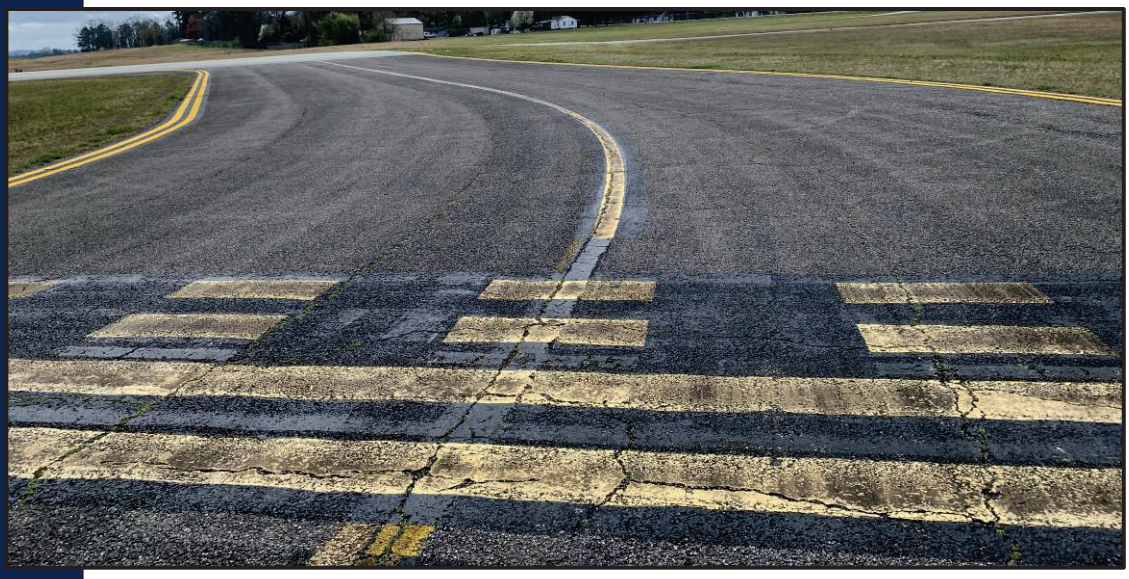
REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION



RMG Taxiway B West Rehabilitation

Rome, Georgia

PREPARED FOR:

Crawford, Murphy & Tilly, Inc.
3330 Cumberland Boulevard SE
Suite 125
Atlanta, Georgia 30339

NOVA Project Number: 10102-2026071
May 20, 2026

NOVA
ENGINEERING AND ENVIRONMENTAL

May 20, 2026

CRAWFORD, MURPHY & TILLY, INC.
3330 Cumberland Boulevard SE
Suite 125
Atlanta, Georgia 30339

Attention: Mr. Mike Reiter, P.E.
Aviation Group Manager

Subject: Report of Subsurface Exploration and Geotechnical Engineering Evaluation
RMG TAXIWAY B WEST REHABILITATION
Rome, Floyd County, Georgia
NOVA Project Number 10102-2026071

Dear Mr. Reiter:

NOVA Engineering and Environmental, LLC (NOVA) has completed the authorized Geotechnical Engineering Report for the RMG Taxiway B West Rehabilitation project located in Rome, Floyd County, Georgia. The services were performed in general accordance with NOVA Proposal Number 003-20217785.3, revised February 13, 2026. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided, and presents our findings, conclusions, and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, LLC
Georgia Engineering License No. PEF005170

Fushata A. Mohammed, E.I.T
Project Engineer

Marc D. Johnston, P.E.
Principal Engineer
GA P.E. License No. 027809

Copies Submitted: Addressee (electronic)

DRAFT

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Appendix G – Qualifications of Recommendations

1.0 INTRODUCTION

This section provides information relating to our contract, the purpose of our services, and a summary of our understanding of the project.

1.1 NAME AND LOCATION OF PROJECT

The RMG Taxiway B West Rehabilitation project is located north of Runway 7-25 at the Richard B Russell Regional Airport in Rome, Floyd County, Georgia. The Floyd County Tax Assessor's office maps the site as 530.98 acres in 2 parcels identified by Parcel Numbers J10W037 and J10Z084. The acreage of Parcel J10Z084 was not available at the time of the study.

The location of the site is indicated on the Site Location Map included as Figure 1 in Appendix A.

1.2 AUTHORIZATION AND SCOPE OF STUDY

Our services on this project were as described in our Proposal Number 003-20217785.3, revised on February 13, 2026, which was authorized by you on March 2, 2026.

The primary objective of this project was to perform a geotechnical exploration within the areas of the proposed construction and to assess these findings as they relate to geotechnical aspects of the planned site development. The authorized geotechnical engineering services included a site reconnaissance, soil test borings and sampling, pavement coring, laboratory testing, engineering evaluation of the field and laboratory data, and the preparation of this report.

The assessment of the presence of wetlands, floodplains, or water classified as state waters was beyond the scope of this exploration. Additionally, the assessment of site-specific seismic class, site environmental conditions, including the detection of pollutants in the soil, rock, or groundwater, at the site was also beyond the scope of this geotechnical exploration and evaluation.

2.0 PROJECT INFORMATION

Our understanding of this project is based on email correspondence with Mr. Mike Reiter, Aviation Group Manager of Crawford, Murphy and Tilly, Inc. on October 7th, 2024, review of the provided project document, a site reconnaissance during boring layout, and our experience with similar projects.

2.1 SITE PLANS AND DOCUMENTS

We were furnished with the RMG_Txwy Bravo West Relocation_Geotech Locations Sketch_Oct 2024, prepared by Crawford, Murphy & Tilly, Inc, dated October 3, 2024.

2.2 PROJECT SITE

The Subject Property is currently developed as the existing Richrd B Russell Regional Airport with associated driveways and parking. It is bordered by the following:

DIRECTION	LAND USE DESCRIPTION/OBSERVATIONS
NORTH	Jones Mill Road
EAST	Old Dalton Road NE
SOUTH	Gurley Drive NE
WEST	Warren Road NE

Based on Floyd County Geographic Information System (GIS), elevations within the proposed project limits range from approximately 643 feet-NAVD88 in the western part to approximately 635 feet-NAVD88 in the eastern part of the project limits. A topographic map depicting the elevations on the Subject Property is included as Figure 2 in Appendix A.

2.3 PROPOSED DEVELOPMENT

We understand the proposed development consists of the rehabilitation of the existing Taxiway B pavements and construction of a new segment of Taxiway B at a uniform offset from the RW 7/25 centerline with subsequent adjustments to each of the hangar area access taxiways.

Proposed finished grades for the new pavement sections were not provided. We have assumed final site grades will be similar to existing site grades with maximum cuts/fills on the order of 3 feet.

3.0 SUBSURFACE EXPLORATION

3.1 AREA GEOLOGY

The site is located in the Valley and Ridge Physiographic Province a broad northeasterly-trending area underlain by sedimentary and metamorphic rocks from 430 to 570 million years old. The Blue Ridge Physiographic Province bounds the Valley and Ridge Province to the north, and the Piedmont Physiographic Province bounds the Valley and Ridge Province to the south.

According to the "Geology of the Georgia – State Map of 1976", the site is underlain by Ridge and Valley Sedimentary Rocks, Mississippian- Floyd Shale (Mfs) and Fort Payne Chert (Mfp). This Floyd Shale consists of Hartselle Sandstone Member (Mh) and and unnamed limestone member (Ml) while the Fort Payne Chert consists of Lavender Shale member (Mls), shown in Figure 3 in Appendix A.

Soils in the region are primarily the product of in-situ chemical decomposition and chemical solution weathering of the parent rock. Sandstones and shales typically revert to sands and clays. The limestone will generally revert to calcium and magnesium solution, with the insoluble remainder, usually in the form of clay. The extent of the weathering is influenced by the mineral composition of the rock, the orientation of the rock strata, and defects such as fissures, faults, and fractures. Limestone often has a slotted and pinnacled surface and may contain fingers of more resistant material projecting upward through the soil mass or contain subterranean solution caverns.

The site is in a geologic area that has the potential for void formation within the soil mass due to soil migration into solution cavities in the underlying rock.

Collapse of the soil mantle into these solution openings result in the formation of "sinkholes" on the ground surface and/or the loss of adequate structural support. Although the subsurface data gathered on the site does not clearly indicate that widespread solutioning is currently taking place on the site, it is possible that some solution cavities, caverns, etc. exist at greater depths or in unexplored areas.

Regardless of the thoroughness of a subsurface exploration, the potential for future settlements or loss of structural support as a result of solution weathering of the underlying carbonate rock and resulting sinkhole development is present on this site, and the owner must accept the inherent risks associated with building in this geologic area.

3.2 FIELD EXPLORATION

Our field exploration was conducted on March 9 and 10, 2026, and included the following:

- Collection of 24 pavement cores at boring locations SB-1 through SB-23, and SB-36 to document the existing pavement sections.
- 24 soil test borings (STBs) numbered SB-1 through SB-23, and SB-36 drilled within the existing pavement sections at depths ranging from 3 to 7½ feet below the existing grade.
- 14 STBs numbered SB-24 through SB-35, SB-37, and SB-38 drilled within the proposed pavements at depths ranging from 6 to 10 feet below the existing grade
- Evaluating the existing pavement conditions at each boring location to document visible distresses that were present at the time of our field exploration.
- Collection of 2 bulk samples for subsequent laboratory testing.

Test locations were established in the field by NOVA personnel using a handheld GPS device and estimating distances and angles from site landmarks. Prior to initiating field testing, underground utilities were marked by a private utility locating firm. Underground utility related adjustments of the test locations were made at the time of the field exploration. The approximate test locations are shown on Figure 4 in Appendix A. If increased accuracy is desired by the client, test locations and elevations may be surveyed.

3.3 PAVEMENT CORING

Prior to conducting the STBs, pavement coring operations were performed at each of the boring locations in the existing pavements (SB-1 through SB-23, and SB-36) to obtain the pavement section thicknesses. A pickup-mounted coring rig was used to collect the pavement cores.

A total of 24 cores were extracted during this exploration. The cores and their respective base material thicknesses were measured to the nearest one-eighth ($^1/_8$) inch. Distress cores were obtained to analyze the depths of cracking. Note that 2 of the distressed cores (numbers SB-4 and SB-8) had full-depth cracking of approximately 2 inches. The core numbered SB-5 also had had full-depth cracking causing the core to be withdrawn from the core hole in small pieces. One core (number SB-2) had a bottom-up cracking of approximately 3 inches. All retrieved core samples were returned to our office for photographing. Measurements of the pavement sections at each boring location are presented in the table below. A Core Photo Log is presented in Appendix D of this report.

The measured thickness of asphalt at the tested locations ranged from 1 to 10½ inches, with an average of 3⅝ inches.

Measured graded aggregate base (GAB) thickness at all the tested locations ranged from 3 to 9 inches with an average of 5⅛ inches.

CORE DATA SUMMARY		
Boring Location	Asphalt Thickness [Inches]	Graded Aggregate Base (GAB) [inches]
SB-1	5¾	5
SB-2	5¼	5
SB-3	1¾	4
SB-4	1¾	3
SB-5	1	3
SB-6	3⅞	7
SB-7	2	9
SB-8	2	6
SB-9	2½	4
SB-10	5	6
SB-11	1⅞	7½
SB-12	2⅛	3
SB-13	2	6
SB-14	4⅞	5½
SB-15	3¾	4
SB-16	3¾	3
SB-17	3½	3
SB-18	4½	3
SB-19	3⅞	6½
SB-20	4½	5
SB-21	7½	4
SB-22	10½	7
SB-23	3	5½
SB-36	1½	8
Average	3⅝	5⅛

3.4 EXISTING PAVEMENT CONDITION

In addition to the pavement cores, each boring location was visually assessed and photographed to obtain data on the existing pavement conditions and to document any visible distresses that were visually present at the time of the field exploration.

The existing flexible pavements were observed to be distressed with moderate to high severity longitudinal, transverse, block, and fatigue cracking throughout the area. Some of the cracks had vegetation growing through them. Some of the pavement's surface appeared to be highly oxidized and brittle. Standing water was observed on the pavement in SB-9 area suggesting poor drainage in that area.

A Visual Distress Photo Log is presented in Appendix E of this report.

3.5 LABORATORY TESTING

Following completion of the field services, soil samples obtained in the field were returned to our office for classification using visual/manual methods in general accordance with the Unified Soil Classification System (USCS) and ASTM designations. In addition to visual classification, the following laboratory tests were performed on 2 bulk samples collected during the drilling operations.

- Moisture Content
- Atterberg Limits
- Sieve Analysis
- Modified Proctor
- California Bearing Ratio (CBR)

The purpose of the testing program was to classify the subsurface materials relative to the Unified Classification System and to assess their physical characteristics. The laboratory test results are summarized in the tables below. Detailed descriptions of the tests performed are presented in Appendix C.

The soil samples will be discarded following the submittal of this report, unless you request otherwise in writing.

Boring Number	Depth [feet]	Moisture Content [%]
SB-7	1-2.5	16.5
SB-8	1-2.5	14.5
SB-8	3.5-5	19.1
SB-9	3.5-5	22.8
SB-10	3.5-5	21.5
SB-10	6-7.5	14.5
SB-11	3.5-5	26.2
SB-22	3.5-5	11.4
SB-28	6-7.5	21.1
SB-34	1-2.5	20.9
SB-35	1-2.5	22.0
SB-37	1-2.5	16.3
SB-38	1-2.5	21.6

Bulk Sample	Depth (ft)	Moisture Content (%)	Percent Passing Size 200 Sieve (%)	LL (%)	PL (%)	PI (%)	USCS Classification	Optimum Moisture Content (%)	Maximum Dry Density (pcf)	*CBR (%)
SB-23	0-5	13.9	32.1	30	18	12	SC	9.8	129.3	4.1
SB-26	0-5	27	79.8	31	19	12	CL	15.3	117.0	1.8

**CBR remolded to 95% of the modified proctor MDD*

3.6 SUBSURFACE CONDITIONS

The following paragraphs provide generalized descriptions of the subsurface conditions encountered by the borings conducted during this exploration.

The Soil Boring Records in Appendix B should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at each boring location. These records represent our interpretation of the subsurface conditions based on the field logs and visual observations of samples by an engineer. The lines designating the

interface between various strata on the Boring Records represent the approximate interface locations and elevation. The actual transition between strata may be gradual.

The groundwater levels reported on the Test Boring Records represent measurements made at the completion of the STBs. The STBs were subsequently backfilled with the soil cuttings and patched with cold mix asphalt.

3.6.1 Asphalt

Approximately 1 to 10½ inches of existing asphaltic concrete was encountered at boring locations SB-1 through SB-23, and SB-26. The asphaltic concrete was underlain by approximately 3 to 9 inches of Graded Aggregate Base (GAB).

3.6.2 Topsoil

Approximately 2 to 5 inches of topsoil was encountered in SB-24 through SB-35, SB-37, and SB-38 located in the proposed pavements areas. Topsoil thickness is frequently erratic, and thicker zones of topsoil may be present in areas intermediate of the borings.

3.6.3 Fill

Fill was encountered in borings SB-10 and SB-21 to an approximate depth of 2 feet below the existing grade. The fill was typically described as sandy CLAY, with standard penetration resistance values of 11 and 8 blows per foot (bpf), respectively.

3.6.4 Residuum

Residual soils were encountered in all the borings beneath the topsoil, asphalt, GAB, and fill. The residuum was typically described as sandy CLAY and clayey SANDs. Standard penetration resistances ranged from 0 to 88 bpf, but more typically varied from 20 to 50 bpf. Wight-of-Hammer materials were encountered in SB-10 and SB-11 at depths ranging from 1 to 5 feet below the existing grade. Note that these samples were wet at the time of sampling.

3.6.5 Partially Weathered Rock (PWR)

Partially weathered rock (PWR) is a transitional material between soil and the underlying parent rock that is defined locally as materials that exhibit a standard penetration resistance exceeding 100 bpf.

As summarized in the table below, PWR was encountered in 10 of the borings located in the existing pavements, and 4 borings in the proposed pavements at depths ranging from ¼ to 9 feet below the existing grade, (corresponding to approximate elevations ranging from 638.75 to 628.5 feet-NAVD88). PWR is typically observed immediately above auger refusal levels. 1 boring (SB-38) contained PWR layer underlain by residual soils, which are called PWR lens. Multiple lens layers may be found before the transition to bedrock occurs. These varying layers are shown in greater detail on the Boring Records in Appendix B of this report.

TOP OF PWR			
STB No.	Location	Approx. Depth [feet]	Approx. Elevation [feet, NAVD88]
SB-12	Existing Pavement	½	636.5
SB-13	Existing Pavement	1	636
SB-14	Existing Pavement	1	634
SB-15	Existing Pavement	½	634.5
SB-16	Existing Pavement	½	634.5
SB-17	Existing Pavement	3½	628.5
SB-18	Existing Pavement	3½	630.5
SB-19	Existing Pavement	1	634
SB-20	Existing Pavement	1	634
SB-22	Existing Pavement	1½	637.5
SB-23	Existing Pavement	6	632
SB-26	Proposed Pavement	9	631
SB-30	Proposed Pavement	¼	638.75
SB-31	Proposed Pavement	¼	637.75
SB-38*	Proposed Pavement	5-8	635-632

Elevations interpolated from Floyd County GIS and should be considered appropriate
**PWR Lense*

3.6.6 Auger Refusal Materials

Auger refusal materials are any very hard or very dense material, frequently boulders or the upper surface of bedrock, which cannot be penetrated by a soil auger. As summarized in the table below, auger refusal was encountered in borings B-13 through B-15 at depths ranging from 1 to 5 feet below existing grade (corresponding to approximate elevations of 803 to 810 feet-NAVD88, respectively). These elevations are based on Floyd County GIS and should be

considered approximate. Should more accurate elevations be desired, we recommend the boring locations be surveyed.

Auger refusal materials are shown in greater detail in the Boring Logs in Appendix B of this report.

REFUSAL DEPTHS/ ELEVATIONS			
STB No.	Location	Approx. Depth [feet]	Approx. Elevation [feet, NAVD88]
SB-13	Existing Pavement	3	634
SB-14	Existing Pavement	3	631
SB-30	Proposed Pavement	6	633
SB-31	Proposed Pavement	6	632

Elevations interpolated from Floyd County GIS and should be considered appropriate

3.7 GROUNDWATER CONDITIONS

Groundwater level was measured upon completion of drilling. As summarized in the table below, groundwater was encountered in 4 borings located in the existing pavement areas at depth ranging from 4 to 6 feet below the existing grade (approximate elevations of 636 to 632 feet-NAVD88). The stabilized 24-hour groundwater level was not measured due to safety concerns.

Groundwater in the Ridge and Valley typically occurs as an unconfined or semi-confined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix, as well as fractures, joints and discontinuities in the underlying bedrock can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff, and other site-specific factors. Groundwater levels are generally lowest in the late summer-early fall and highest in the late winter-early spring, with annual groundwater fluctuations of 4 to 8 feet; consequently, the water table may be different from that measured during this study.

DEPTH TO GROUNDWATER / ELEVATIONS			
STB No.	Location	Approx. Depth [feet]	Approx. Elevation [feet, NAVD88]
SB-9	Existing Pavement	4	636
SB-10	Existing Pavement	6	633
SB-21	Existing Pavement	5	633
SB-23	Existing Pavement	6	632

Elevations interpolated from Floyd County GIS and should be considered appropriate

4.0 GEOTECHNICAL ASSESSMENT

The following assessment is based on our understanding of the proposed development, site observations, our evaluation and interpretation of the field data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and practices.

Based on our professional opinion, the site and subsurface conditions were deemed favorable for the planned development provided the recommendations detailed in this report are followed. Based on our findings, there were no identified unsuitable soils such as organic-laden fill, light-weight silts or plastic clays encountered to the depths explored during this study. However, PWR and auger refusal materials were encountered across the project limit at depths ranging from ¼ to 9 feet below the existing grade. Therefore, depending on final grades of the proposed new pavements, materials requiring difficult excavations techniques may be encountered during mass grading.

Groundwater was encountered in 5 borings located within the proposed and exiting pavements at depths ranging from 4 to 9 feet below existing grade. Based on planned finished grades, we do not anticipate significant groundwater will be encountered during construction. However, perched, or trapped water within the residual soils may be encountered. In such an event, temporary dewatering may be accomplished with sump pumps and/or well points.

Low consistency materials were encountered in some of the borings during this study. In the event that unstable or very soft materials are encountered upon stripping the topsoil, typical recommendations will include undercutting and replacing with compacted structural fill or stabilizer aggregate.

It should be noted that subsurface conditions in unexplored locations may be different from those encountered at the test locations considered and discussed herein. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

The following sections present our recommendations for site preparation and grading, and for the resurfacing of the pavements.

5.0 RECOMMENDATIONS

5.1 SITE PREPARATION

Prior to proceeding with construction, all pavements, vegetation, root systems, topsoil, and other deleterious non-soil materials should be stripped from proposed construction areas. Topsoil may be stockpiled and subsequently re-used in landscaped areas. Debris-laden materials, if present, should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations. All existing utility locations should be reviewed to assess their impact on the proposed construction and relocated/grouted in-place as appropriate.

After clearing and stripping, areas that are at grade or which will receive fill should be carefully evaluated by a NOVA geotechnical engineer. This evaluation should initially include observation of the materials exposed below the stripped subgrade, The exposed materials should be proofrolled with multiple passes of a 20 to 30 ton loaded truck, or other vehicle of similar size and weight under the observation of the geotechnical engineer. The purpose of the proofrolling is to locate soft, weak, or excessively wet fill or residual soils present at the time of construction. Unstable materials observed during the evaluation and proofrolling operations should be undercut and replaced with structural fill or stabilized in-place by scarifying and re-densifying.

Should low consistency and/or debris laden fill materials be encountered during construction, it may need to be excavated and replaced or stabilized in place. Actual remedial recommendations can best be determined by the geotechnical engineer in the field at the time of construction.

The site should be graded during construction such that positive drainage is maintained away from the construction areas, to prevent ponding of storm water on the site during and shortly following significant rain events. The construction areas should also be sealed and crowned with a smooth roller to minimize ponding water from storm events at the end of each day of work.

Based on the natural moisture contents measured during our exploration, most of the existing subgrade soils are well above the optimum moisture content. These wet subgrade soils will likely be unstable and will quickly degrade under construction traffic. Aeration, drying and re-compaction of the existing soil subgrades should be anticipated during construction.

5.2 EXCAVATION

PWR was encountered across the site at depths ranging from ¼ to 9 feet (at approximate elevations of 638.75 to 628.5 feet-NAVD88). Therefore, depending on finished grade of the proposed pavements, materials requiring difficult excavation may be encountered during grading. Excavation of PWR typically requires heavy equipment for removal. The use of rippers can ease the excavation of PWR during construction. Often, resistant layers are present within the PWR, and excavation may require blasting or pneumatic equipment.

Auger refusal, which can represent a boulder, a rock ledge, or the surface of bedrock, was encountered in borings SB-12, SB-13, SB-31, and SB-32 at depths ranging from 3 to 6 feet below existing grade. Therefore, ***materials requiring difficult excavation techniques and/or blasting may be encountered during the grading of the proposed new pavements.*** The quality, composition, bedding, faulting, and fracturing of the rock (refusal) mass will dictate the need for blasting. A discussion of various excavation methods is provided below in the event excavations must penetrate PWR and/or bedrock:

Ripping: Mass excavation of very hard or very dense soils (≥ 50 bpf) and PWR will likely require loosening the material with a large single-toothed ripper or track-mounted backhoe before removal with conventional earthmoving equipment. In confined areas, such as utility trenches, excavations of very hard or very dense soils (≥ 50 bpf) and PWR, may require either the use of pneumatic tools or light blasting.

Rock Gradation: The gradation of the material removed by ripping or blasting will be erratic, particularly the upper zones of fractured rock. Re-use of these materials in fills will require additional effort and control, as described in the Fill Placement report section.

Rock Definition: The definition of rock can be source of conflict during construction. If a classified excavation contract is selected by the owner, the following definitions have been incorporated into classified excavation specifications on other projects and are provided for your general guidance.

We recommend that the determination and confirmation of difficult excavation materials be performed by the NOVA geotechnical engineer in accordance with the project specifications. Measurement of the quantities of difficult excavation materials should be performed by the project surveyor.

General Excavation - Blast Rock: Any material which cannot be excavated with a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not

less than 56,000 pounds (Caterpillar D-8K or equivalent) or by a Caterpillar 977 front-end loader or equivalent.

Trench Excavation - Trench Rock: Any material which cannot be excavated with a backhoe having a bucket curling force rated at not less than 35,500 pounds (Caterpillar Model 225 or equivalent).

5.3 FILL PLACEMENT

5.3.1 Fill Suitability

Fill materials should be low plasticity soil (Plasticity Index less than 30), free of non-soil materials and rock fragments larger than 3 inches in any one dimension. Based on visual examination and our laboratory testing, the existing subgrade soils encountered during this exploration generally appear suitable for re-use as structural fill. Prior to construction, bulk samples of the proposed fill materials should be laboratory-tested to confirm their suitability.

All materials to be used for backfill or compacted fill construction should be evaluated and, if necessary, tested by NOVA prior to placement to determine if they are suitable for the intended use. In general, based upon the boring results, the near surface soils such as those encountered in the borings can be used as a structural fill as well as general subgrade fill and backfill, provided that the fill material is free of debris and organics. Any off-site materials used as fill should be approved by NOVA prior to acquisition.

Organic and/or debris-laden material is not suitable for re-use as structural fill. Topsoil, mulch, and similar organic materials can be wasted in architectural areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

5.3.2 Soil Compaction

Fill should be placed in thin, horizontal loose lifts (maximum 8-inch) and compacted to at least 95 percent of the modified Proctor maximum dry density (ASTM D 1557). The upper 8 inches of soil beneath pavements should be compacted to at least 98 percent of the maximum dry density. In confined areas, such as utility trenches or behind retaining walls, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 100 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 2 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Moisture control may be difficult during rainy weather. Soils excavated from below the groundwater table will likely require significant efforts to achieve acceptable moisture contents prior to re-use as fill.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. The technician can also document compliance with the specifications by performing field density tests using the nuclear or sand cone testing methods (ASTM D6938, or D1556, respectively). One test per 400 cubic yards and every 2 feet of placed fill is recommended, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed.

The site should be graded during construction to maintain positive drainage away from the construction areas, to prevent ponding of storm water on the site during and shortly following significant rain events. The construction areas should be sealed and crowned with a smooth roller to minimize ponding water from storm events at the end of each day of work.

5.4 GROUNDWATER CONTROL

During this study, groundwater was encountered in borings, SB-9, SB-10, SB-21, and SB-23 at depths ranging from 4 to 6 feet below existing grades (approximate elevations ranging from 632 feet-NAVD88 to 636 feet-NAVD88). In addition, trapped or perched water within the granular pockets of the residual soils should be anticipated. Depending on the area of the site under consideration, groundwater levels have differing implications for design and construction.

As previously noted, groundwater levels are subject to seasonal, climatic, and other variations and may be different at other times and locations. The extent and nature of any dewatering required during construction will be dependent on the actual groundwater conditions prevalent at the time of construction, and the effectiveness of construction drainage to prevent run-off into open excavations.

5.5 PAVEMENT REHABILITATION

The existing asphalt pavements were generally observed to be highly oxidized with moderate to high severity distresses. The most severe distress observed was fatigue and

paving joint longitudinal cracking, which was prevalent in most parts of the pavements assessed. Most of the cracks were observed to have weeds growing through them.

Recorded pavement thickness varies greatly across the site with asphalt thicknesses ranging from 1 to 10½ inches. Consequently, a rehabilitation program consisting solely of mill and inlay may not be possible in areas with less than 4 inches of existing asphalt. Full reconstruction of some of the pavements will likely be required.

If areas are selected for mill and inlay rather than reconstruction, after milling, we recommend cleaning and filling any remaining cracks and the application of a crack relief layer to help minimize reflective cracking in the new pavement surface.

All asphalt materials and paving operations should meet applicable specifications of the FAA and the current Georgia Department of Transportation Standard Specifications. A NOVA technician should observe placement and perform density testing of the laid asphalt.

5.6 PAVEMENT DESIGN RECOMMENDATIONS

The site subgrade soils are weather sensitive and will be susceptible to loss of strength and density if exposed to freeze/ thaw and/or wetting/drying cycles. Consequently, immediately prior to base stone placement all pavement subgrades should be properly prepared and evaluated by the geotechnical engineer including a proofroll to document stability of the subgrade and identify any weak or loose areas that may require remediation. All pavement subgrades, which may be exposed to weather, must be properly graded to allow drainage, and prevent ponding of water on the pavement subgrade which would reduce its support capabilities.

Based on the field data collected during this study, pavement subgrade soils are anticipated to consist of residuum and fill soils consisting primarily of clayey SAND and sandy CLAY. The laboratory CBR samples consisted of composite bulk samples collected from the subgrade soils at various borings as described in Section 3 of this report, which were remolded to 95 percent of their modified Proctor (ASTM D1557) maximum dry density and soaked in accordance with ASTM requirements prior to penetration. Based on the laboratory test results, we recommend a **CBR value of 4** be utilized for the design of the flexible pavement sections. The upper 1 foot of subgrade should be compacted to a minimum of 98 percent of the modified Proctor (ASTM D 1557) maximum dry density.

We recommend the graded aggregate base material to be used as pavement base be compacted to a minimum of 98 percent of the maximum dry density as determined by the modified Proctor compaction test (ASTM D 1557, Method C). The crushed stone

should conform to applicable sections of the FAA and State of Georgia Department of Transportation Standard Specifications for Road and Bridge Construction. All asphalt material and paving operations should meet applicable specifications of the Asphalt Institute, FAA, and Georgia Department of Transportation. A NOVA technician should observe placement and perform density testing of the base course material and asphalt paving operations.

6.0 LIMITATIONS

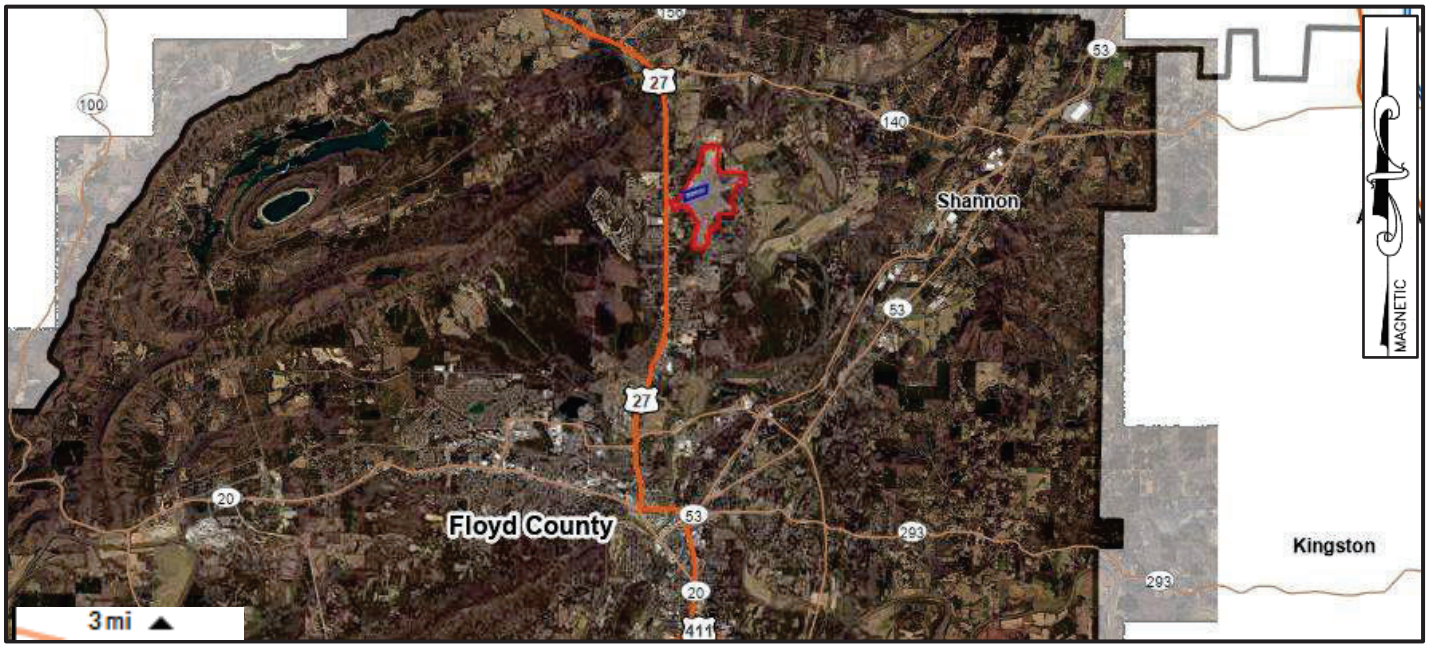
The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at significantly later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between test locations will differ from those encountered at specific test locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

This report is intended for the sole use of **Crawford, Murphy & Tilly, Inc.,** for the above-mentioned project. The scope of services performed during this study may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations, or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Georgia. This warranty is in lieu of all other statements or warranties, either expressed or implied.

APPENDIX A
Figures and Maps



Approximate Limits of Subject Property

Approximate Project Limits

FIGURE 1
SITE LOCATION MAP
SOURCE: Floyd County GIS Browser
SCALES: Graphic As Shown Above

NOVA
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RMG Taxiway B West Rehabilitation
Rome, Floyd County, Georgia
NOVA Project Number 10102-2026071

FIGURE 2
TOPOGRAPHIC MAP
Source: Floyd County GIS
Scale: Graphic As Shown Above

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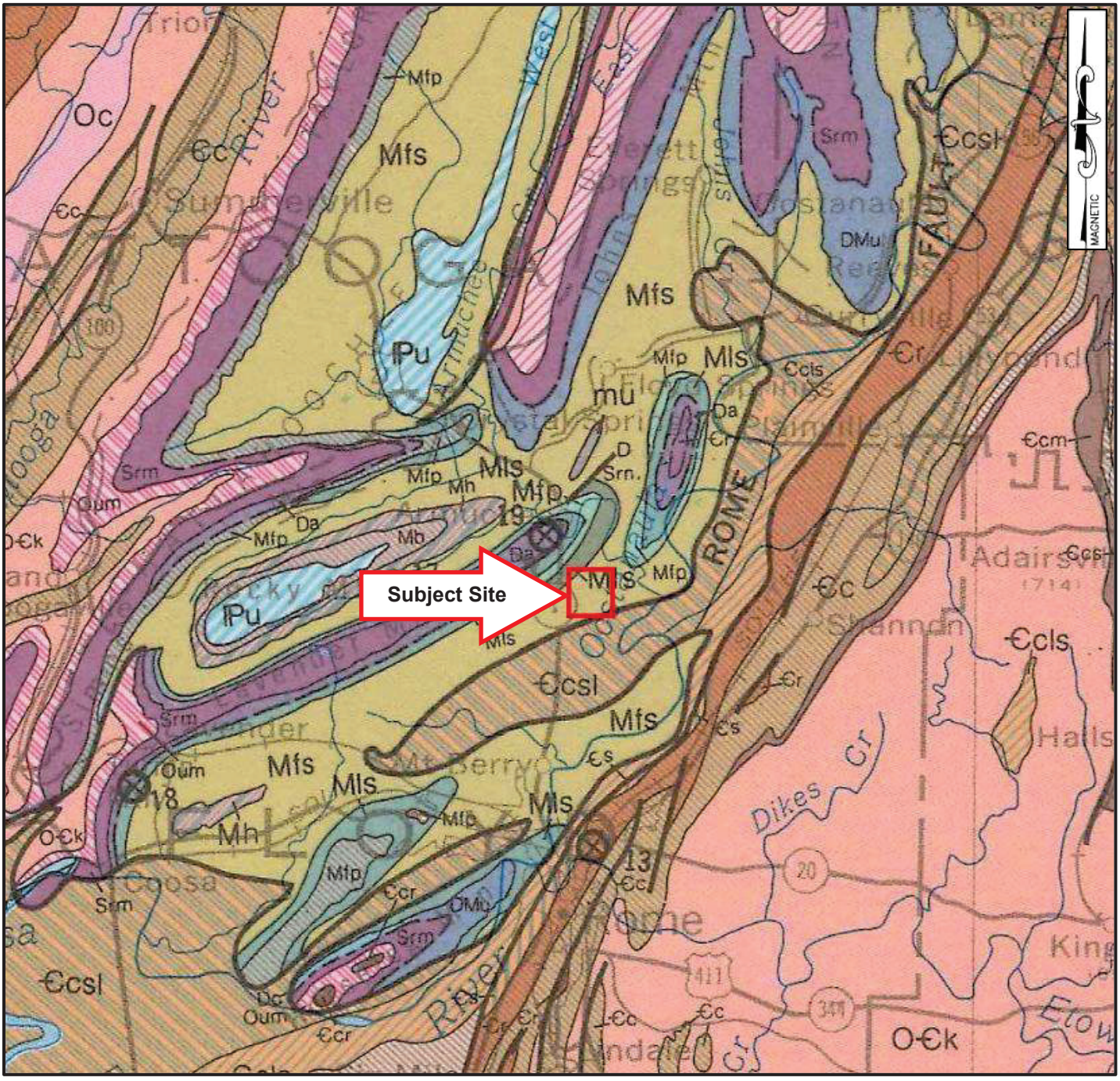
RMG TAXIWAY B WEST REHABILITATION
Crawford, Murphy and Tilly, Inc.
Rome, Floyd County, Georgia
NOVA Project Number 10102-2026071



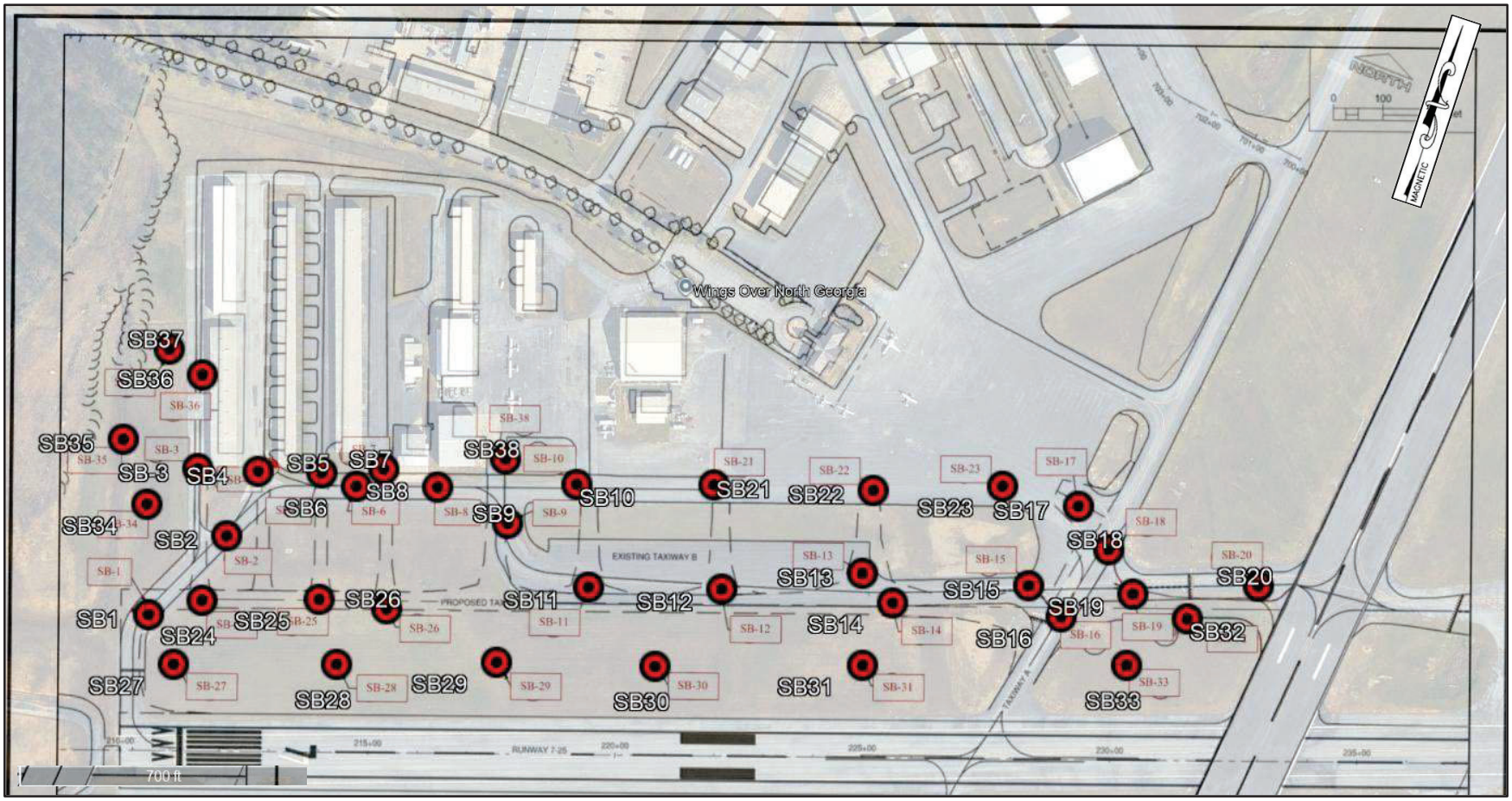
APPROXIMATE BOUNDARY OF SUBJECT PROPERTY

Ridge and Valley Sedimentary Rocks:
Floyd Shale (Mfs): include the HARTSELLE SANDSTONE MEMBER (Mh) and unnamed limestone member (Ml)

FIGURE 3
REGIONAL GEOLOGY
Source: Geology of Georgia State Map – 1976
Accessed 4/1/2022
Scale: NTS

NOVA ENGINEERING AND ENVIRONMENTAL

RMG TAXIWAY B WEST REHABILITATION
Crawford, Murphy and Tilly, Inc.
Floyd, Fulton County, Georgia
NOVA Project Number 10102-2026071



APPROXIMATE LOCATION OF NOVA SOIL TEST BORINGS

FIGURE 4
BORING LOCATION PLAN
Source: RMG Taxiway B West Rehabilitation Soil Boring and Survey Layout/ Google Earth
Scale: Graphic As Shown Above

NOVA
ENGINEERING AND ENVIRONMENTAL

RMG TAXIWAY B WEST REHABILITATION
Crawford, Murphy & Tilly, Inc.
Rome, Floyd County, Georgia
NOVA Project Number 101020-2026071

APPENDIX B
Subsurface Data

FIELD EXPLORATION

Soil Test Borings: The STBs were performed in general conformance with ASTM Designation D1586, "Penetration Test and Split-Barrel Sampling of Soils". Hollow stem augers were used to advance the borings. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance is an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in jars and transported to our laboratory for further evaluation.

Test Boring Records in Appendix B show the standard penetration test (SPT) resistances, or “N-values”, and present the soil conditions encountered in the borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the split-barrel samples, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials may be gradual.

The groundwater levels reported on the Test Boring Records represent measurements made at the completion of the soil test boring. Subsequent to completion of the groundwater readings, boreholes were backfilled with soil cuttings from the drilling process.

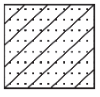
KEY TO SYMBOLS AND CLASSIFICATIONS

DRILLING SYMBOLS

	Standard Penetration Testing Sample
	Undisturbed Sample (UD)
	Auger without Sampling
	Rock Core Sample
	Standard Penetration Resistance (ASTM D1586)
	Dynamic Cone Penetrometer (DCP) Resistance
	Water Table at least 24 Hours after drilling
	Water Table 1 Hour or less after drilling
50/2"	Number of Blows (50) to Drive the Spoon a Number of Inches (2)
NX, NQ	Core Barrel Sizes: 2⅛- and 2-Inch Diameter Rock Core, Respectively
REC	Percentage of Rock Core Recovered
RQD	Rock Quality Designation - Percentage of Recovered Core Segments 4 or more Inches Long
	Loss of Drilling Fluid
N/E	Not Encountered
N/M	Not Measured
C	Boring Cave-in Depth
WOH	Weight of Hammer

DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in general accordance with ASTM D1586-18[e1]. The standard penetration resistance (N-value) is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.375-inch I.D. split-barrel sampler one foot. Core drilling performed in general accordance with ASTM D2113-14. The undisturbed sampling procedure is described by ASTM D1587-15. Unless other arrangements are made, NOVA will dispose of all soil and rock samples at the time of report submission.

	Paving		Well Graded Sand - SW		Silt - ML
	Gravel / Graded Aggregate Base		Silty Sand - SM		Elastic Silt - MH
	Fill		Clayey Sand - SC		Low Plasticity Clay - CL
	Topsoil		Poorly graded silty, clayey sand - SM/SC		High Plasticity Clay - CH
	Alluvium		Clayey Sand and Gravel - SC/GC		Partially Weathered Rock (PWR)
	Poorly Graded Sand - SP		Silty Sand and Gravel - SM/GM		Rock

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CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	Number of Blows, "N"	Approximate Relative Density
	0 – 4	Very Loose
	5 – 10	Loose
SANDS	11 – 30	Medium Dense
	31 – 50	Dense
	Over 50	Very Dense

	Number of Blows, "N"	Approximate Consistency
	0 – 2	Very Soft
	3 – 4	Soft
SILTS	5 – 8	Firm
and	9 – 15	Stiff
CLAYS	16 – 30	Very Stiff
	31 – 50	Hard
	Over 50	Very Hard

SOIL CLASSIFICATION CHART

COARSE GRAINED SOILS	**GRAVELS**	Clean Gravel less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines more than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	SANDS	Clean Sand less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines more than 12% fines	SM	Silty sand
			SC	Clayey sand
FINE GRAINED SOILS	**SILTS AND CLAYS** Liquid Limit less than 50	Inorganic	CL	Lean clay
			ML	Silt
		Organic	OL	Organic clay and silt
	SILTS AND CLAYS Liquid Limit 50 or more	Inorganic	CH	Fat clay
			MH	Elastic silt
		Organic	OH	Organic clay and silt
HIGHLY ORGANIC SOILS		Organic matter, dark color, organic odor	PT	Peat

PARTICLE SIZE IDENTIFICATION

GRAVELS	Coarse	¾ inch to 3 inches
	Fine	No. 4 to ¾ inch
SANDS	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40
SILTS AND CLAYS		Passing No. 200

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TEST BORING RECORD SB-1

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349222

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165893

LOCATION Existing Pavement | **ELEVATION** 641.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 5.75 inches				
		GRADED AGGREGATE BASE: 5 inches				
		RESIDUUM: Stiff to hard white tan brown fine sand CLAY				
						4-5-6 (11)
						12-18-23 (41)
635	5	Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-2

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349773

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165581

LOCATION Existing Pavement | **ELEVATION** 640.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
		ASPHALT: 5.25 inches				
		GRADED AGGREGATE BASE: 5 inches				
		RESIDUUM: Very hard gray tan brown fine sand CLAY				
635	5					33-23-43 (66)
						17-26-40 (66)
		Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-3

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350067

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165912

LOCATION Existing Pavement | **ELEVATION** 644.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
		ASPHALT: 1.75 inches				
		GRADED AGGREGATE BASE: 4 inches				
640		RESIDUUM: Hard gray brown fine sand CLAY				
	5					14-17-26 (43)
		Boring terminated at 5 ft				12-23-27 (50)
635	10					
630	15					
625	20					
620	25					
615	30					
610	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-4

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350163

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165529

LOCATION Existing Pavement | **ELEVATION** 644.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
644	0	ASPHALT: 1.75 inches				
		GRADED AGGREGATE BASE: 3 inches				
		RESIDUUM: Very stiff gray brown fine sand CLAY				
640						8-8-8 (16)
	5	Boring terminated at 5 ft				6-8-9 (17)
635	10					
630	15					
625	20					
620	25					
615	30					
610	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-5

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350274

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165126

LOCATION Existing Pavement | **ELEVATION** 642.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 1 inch GRADED AGGREGATE BASE: 3 inches RESIDUUM: Hard to very hard gray tan brown fine sandy CLAY				12-15-25 (40)
						15-20-33 (53)
635	5	Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-6

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350269

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164880

LOCATION Existing Pavement | **ELEVATION** 641.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 1 inch				
		GRADED AGGREGATE BASE: 7 inches				
		RESIDUUM: Very stiff gray tan brown fine sand CLAY				8-10-14 (24)
						7-11-9 (20)
635	5	Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-7

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350408

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164746

LOCATION Existing Pavement | **ELEVATION** 642.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 2 inches				
		GRADED AGGREGATE BASE: 9 inches				
		RESIDUUM: Very stiff to hard tan brown gray fine sandy CLAY				
						10-16-12 (28)
						14-13-21 (34)
635	5	Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-8

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071
CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350415
PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164370
LOCATION Existing Pavement | **ELEVATION** 641.0 ft (NAVD88)
DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM
DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026
DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 2 inches				
		GRADED AGGREGATE BASE: 6 inches				
		RESIDUUM: Hard to very stiff tan brown coarse to fine sand CLAY				11-18-23 (41)
						14-12-14 (26)
635	5	Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-9

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350357

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.163851

LOCATION Existing Pavement | **ELEVATION** 640.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** 4' ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
		ASPHALT: 2.5 inches				
		GRADED AGGREGATE BASE: 4 inches				
		RESIDUUM: Stiff white tan brown fine sandy CLAY		▽		4-6-7 (13)
635	5					3-6-9 (15)
		Boring terminated at 5 ft				
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-10

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350687

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.163504

LOCATION Existing Pavement | **ELEVATION** 639.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** 6' ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
639	0	ASPHALT: 5 inches	
		GRADED AGGREGATE BASE: 6 inches	
		FILL: Stiff brown gray coarse to fine sand CLAY with rocks	4-7-4 (11)
635		RESIDUUM: Very soft brown gray coarse to fine sand CLAY (wet sample)	WOH-1-1 (2)
	5	Very stiff brown gray coarse to fine sand CLAY	9-12-14 (26)
630		Boring terminated at 7.5 ft	
	10		
625			
	15		
620			
	20		
615			
	25		
610			
	30		
605			
	35		

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-11

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350179

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.163202

LOCATION Existing Pavement | **ELEVATION** 638.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 4'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
638	0	ASPHALT: 1.9 inches				
		GRADED AGGREGATE BASE: 7.5 inches				
635		RESIDUUM: Very soft tan brown gray fine sand CLAY (wet sample)				WOH-WOH WOH (0)
	5	Hard tan brown gray fine sand CLAY				WOH-1-1 (2)
630		Boring terminated at 7.5 ft				14-16-19 (35)
625	10					
620	15					
615	20					
610	25					
605	30					
	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-12

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350415

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.162364

LOCATION Existing Pavement | **ELEVATION** 637.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	ASPHALT: 1.9 inches				
		GRADED AGGREGATE BASE: 3 inches				
		PARTIALLY WEATHERED ROCK: PARTIALLY WEATHERED ROCK: Sampled as very hard black brown gray fine sandy CLAY				50/1"
						50/1"
630	5	Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-13

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350757

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.161518

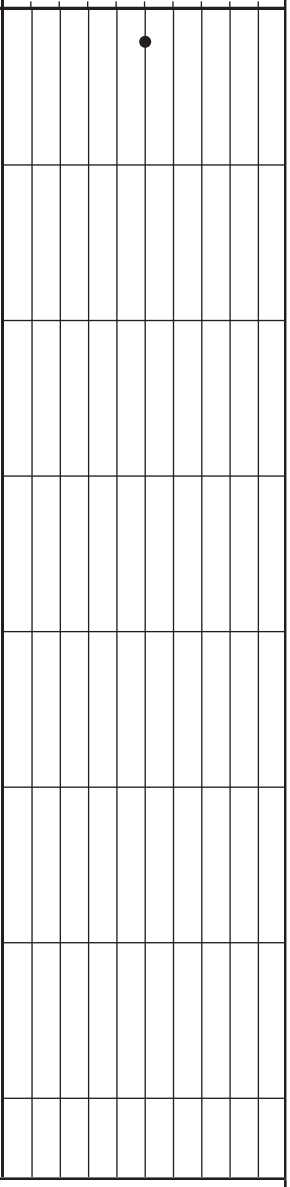
LOCATION Existing Pavement | **ELEVATION** 637.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	ASPHALT: 2 inches				
		GRADED AGGREGATE BASE: 6 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very hard gray fine sand CLAY with rock fragments				
		Auger refusal at 3 ft				
630	5					
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					



Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-14

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350660

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.161263

LOCATION Existing Pavement | **ELEVATION** 635.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ◯ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 4.9 inches				
		GRADED AGGREGATE BASE: 5.5 inches				
	5	PARTIALLY WEATHERED ROCK: Sampled as very hard gray brown fine sand CLAY			◪	50/5"
		Auger refusal at 3 FT				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-15

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351002

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.160450

LOCATION Existing Pavement | **ELEVATION** 635.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 3.75 inches GRADED AGGREGATE BASE: 4 inches PARTIALLY WEATHERED ROCK: Sampled as very hard black gray brown fine sand CLAY				38-50/4" 50/2"
	5	Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-16

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350901

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.160177

LOCATION Existing Pavement | **ELEVATION** 635.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 3.75 inches				
		GRADED AGGREGATE BASE: 3 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very hard black gray brown fine sand CLAY			◪	36-50/3"
					◪	21-50/3"
	5	Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-17

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351503

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.160316

LOCATION Existing Pavement | **ELEVATION** 632.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/M

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 3.5 inches	
		GRADED AGGREGATE BASE: 3 inches	
		RESIDUUM: Very hard black gray brown fine sand CLAY	28-31-39 (70)
	5	PARTIALLY WEATHERED ROCK: Sampled as very hard black gray brown fine sand CLAY	31-50/5"
625		Boring terminated at 5 ft	
	10		
620			
	15		
615			
	20		
610			
	25		
605			
	30		
600			
	35		
595			

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-18

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351335

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.160030

LOCATION Existing Pavement | **ELEVATION** 634.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 4.5 inches				
		GRADED AGGREGATE BASE: 3 inches				
		RESIDUUM: Very hard black gray brown fine sand CLAY				8-25-39 (64)
	5	PARTIALLY WEATHERED ROCK: Sampled as very hard black gray brown fine sand CLAY				50/5"
		Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-19

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351152

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.159780

LOCATION Existing Pavement | **ELEVATION** 635.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 3.9 inches				
		GRADED AGGREGATE BASE: 6.5 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very dense gray brown clayey coarse to fine SAND				17-38-50/5"
	5					36-50/4"
		Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-20

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351425

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.159012

LOCATION Existing Pavement | **ELEVATION** 635.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	ASPHALT: 4.5 inches				
		GRADED AGGREGATE BASE: 5 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very hard gray brown medium to fine sand CLAY				50/5"
	5	No recovery				50/0"
		Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
600	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-21

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350939

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.162646

LOCATION Existing Pavement | **ELEVATION** 638.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** 5' ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	ASPHALT: 7.5 inches				
		GRADED AGGREGATE BASE: 4 inches				
		FILL: Firm gray brown coarse to fine sand CLAY with rock				3-4-4 (8)
		RESIDUUM: Firm gray brown coarse to fine sand CLAY		▽		2-3-5 (8)
630	5	Boring terminated at 5 ft				
625	10					
620	15					
615	20					
610	25					
605	30					
	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-22

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351205

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.161637

LOCATION Existing Pavement | **ELEVATION** 639.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
639	0	ASPHALT: 10.5 inches				
		GRADED AGGREGATE BASE: 7 inches				
635		PARTIALLY WEATHERED ROCK: Sampled as very hard brown gray medium to fine sand CLAY				5-50/4"
	5	Boring terminated at 5 ft				50/5"
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-23

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351466

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.160836

LOCATION Existing Pavement | **ELEVATION** 638.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** 6' ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	ASPHALT: 3 inches		
		GRADED AGGREGATE BASE: 5.5 inches		
		RESIDUUM: Soft gray brown coarse to fine sand CLAY		3-2-1 (3)
	5			3-1-2 (3)
630		PARTIALLY WEATHERED ROCK: Sampled as very hard gray brown coarse to fine sand CLAY with rock fragments		11-29-50/5"
		Boring terminated at 7.5 ft		
625	10			
620	15			
615	20			
610	25			
605	30			
	35			

GRAPHIC LOG

WATER LEVELS (ft) ▽

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments are present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-24

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349394

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165591

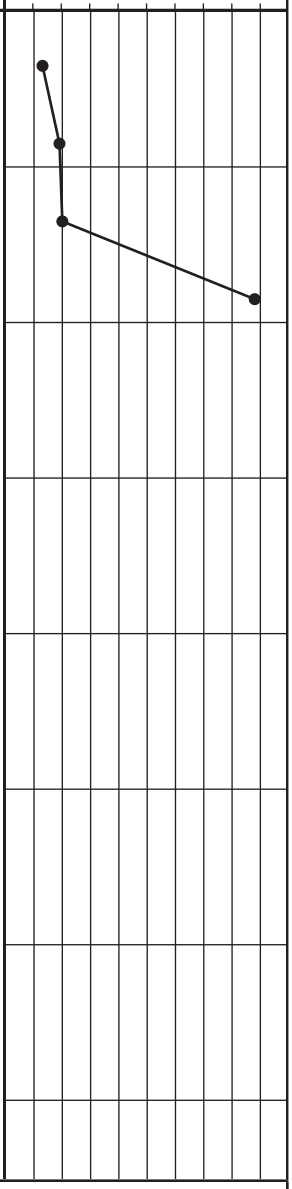
LOCATION Proposed Pavement | **ELEVATION** 641.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 4 inches		
		RESIDUUM: stiff to very hard tan brown gray fine sand CLAY		
635	5			6-6-7 (13)
				7-9-10 (19)
				8-9-11 (20)
630	10	Boring terminated at 10 ft		14-17-71 (88)
625	15			
620	20			
615	25			
610	30			
605	35			



Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-25

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349616

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164860

LOCATION Proposed Pavement | **ELEVATION** 640.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
		TOPSOIL: 2 inches	
635	5	RESIDUUM: Medium dense gray tan brown clayey fine SAND	5-7-9 (16)
			6-8-8 (16)
		Very dense gray tan brown clayey fine SAND	20-19-22 (41)
630	10		15-19-26 (45)
		Boring terminated at 10 ft	
625	15		
620	20		
615	25		
610	30		
605	35		

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-26

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071
CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349693
PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164417
LOCATION Proposed Pavement | **ELEVATION** 640.0 ft (NAVD88)
DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM
DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026
DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** 8'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 4 inches	
		RESIDUUM: Stiff white tan brown medium to fine sandy CLAY	4-6-6 (12)
635	5		4-6-9 (15)
			19-30-33 (63)
630	10	PARTIALLY WEATHERED ROCK: Sampled as very hard gray brown medium to fine sandy CLAY	18-23-50/5"
		Boring terminated at 10 ft	
625	15		
620	20		
615	25		
610	30		
605	35		

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments were present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-27

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349012

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.165626

LOCATION Proposed Pavement | **ELEVATION** 644.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** 8'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 2 inches		
		RESIDUUM: Very dense gray tan brown clayey fine SAND		
	5			15-15-21 (36)
				19-20-26 (46)
635				9-19-23 (42)
	10	Boring terminated at 10 ft		25-26-30 (56)
630	15			
625				
	20			
620				
	25			
615				
	30			
610				
	35			

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-28

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349313

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164606

LOCATION Proposed Pavement | **ELEVATION** 641.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 2 inches		
		RESIDUUM: RESIDUUM: Loose to medium dense tan brown clayey medium to fine SAND		
				3-2-4 (6)
635	5			3-3-4 (7)
				4-4-6 (10)
630	10	Boring terminated at 10 ft		8-11-16 (27)
625	15			
620	20			
615	25			
610	30			
605	35			

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-29

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349621

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.163609

LOCATION Proposed Pavement | **ELEVATION** 639.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
639	0	TOPSOIL: 2 inches		
		RESIDUUM: RESIDUUM: Medium dense to dense tan brown clayey fine SAND		
635	5			10-13-13 (26)
				9-11-13 (24)
630				12-14-19 (33)
	10	Boring terminated at 10 ft		14-16-20 (36)
625	15			
620				
615	20			
	25			
610				
	30			
605				
	35			

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-30

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349893

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.162608

LOCATION Proposed Pavement | **ELEVATION** 639.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	TOPSOIL: 3 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very dense brown gray clayey fine SAND with rock fragments				50/1"
	5					50/1"
		Auger refusal at 6 ft				50/0"
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments were present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-31

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350283

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.161312

LOCATION Proposed Pavement | **ELEVATION** 638.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 5'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	TOPSOIL: 3 inches				
		PARTIALLY WEATHERED ROCK: Sampled as very dense tan brown clayey fine SAND				16-20-15 (35)
	5					28-50/1"
		Auger refusal at 6 ft				50/1"
630	10					
625	15					
620	20					
615	25					
610	30					
605	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-32

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.351125

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.159382

LOCATION Proposed Pavement | **ELEVATION** 634.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
630	0	TOPSOIL: 4 inches		
		RESIDUUM: Hard gray brown fine sand CLAY		
	5			12-21-25 (46)
625				22-22-19 (41)
	10	Boring terminated at 10 ft		17-29-18 (47)
620				25-20-23 (43)
	15			
615				
	20			
610				
	25			
605				
	30			
600				
	35			

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-33

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350772

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.159659

LOCATION Proposed Pavement | **ELEVATION** 637.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 6'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
635	0	TOPSOIL: 4 inches		
		RESIDUUM: Hard to very hard gray brown fine sand CLAY		
	5			11-15-17 (32)
630				19-14-22 (36)
				21-18-25 (43)
	10	Boring terminated at 10 ft		19-33-27 (60)
625				
	15			
620				
	20			
615				
	25			
610				
	30			
605				
	35			
600				

GRAPHIC LOG | WATER LEVELS (ft)

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-34

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.349788

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.166151

LOCATION Proposed Pavement | **ELEVATION** 643.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 3 inches	
		RESIDUUM: Very stiff to hard orange black gray fine sand CLAY	7-11-14 (25)
	5	Very stiff to hard orange black gray fine sand CLAY	10-19-21 (40)
635			9-9-14 (23)
	10	Boring terminated at 10 ft	14-19-23 (42)
630	15		
625	20		
620	25		
615	30		
610	35		

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-35

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350080

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.166444

LOCATION Proposed Pavement | **ELEVATION** 641.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 4 inches	
		RESIDUUM: Very stiff orange brown gray fine sand CLAY	8-10-10 (20)
			7-9-11 (20)
635	5	very hard to very stiff orange brown gray fine sand CLAY	11-22-42 (64)
			12-13-14 (27)
630	10	Boring terminated at 10 ft	
625	15		
620	20		
615	25		
610	30		
605	35		

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA
ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-36

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350558

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.166093

LOCATION Existing Pavement | **ELEVATION** 645.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

DEPTH TO-WATER ▽ **INITIAL** N/E | ▼ **AFTER 24 HOURS** N/M | ○ **CAVING** N/E

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	WATER LEVELS (ft)	SAMPLE TYPE	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	ASPHALT: 1.5 inches				
		GRADED AGGREGATE BASE: 8 inches				
		RESIDUUM: Stiff to very stiff red tan brown fine sand CLAY				
						4-5-7 (12)
						6-7-10 (17)
	5	Boring terminated at 5 ft				
635	10					
630	15					
625	20					
620	25					
615	30					
610	35					

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-37

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350630

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.166359

LOCATION Proposed Pavement | **ELEVATION** 642.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/10/2026

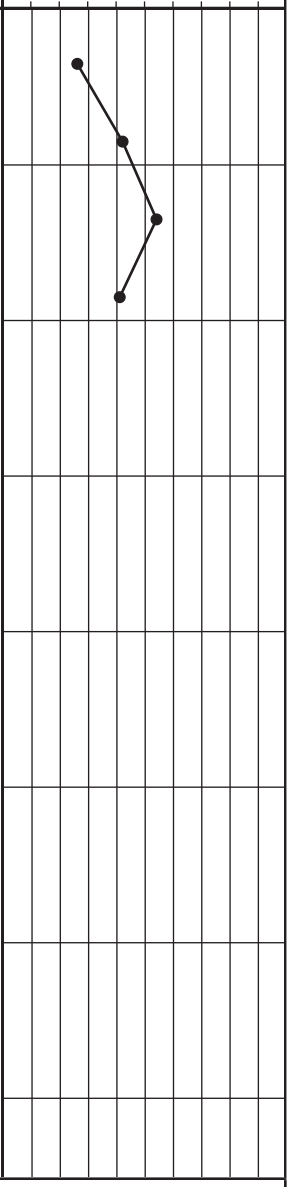
DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 8'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
640	0	TOPSOIL: 4 inches	
		RESIDUUM: Very stiff to hard gray brown fine sand CLAY	12-14-12 (26)
	5		7-20-22 (42)
635		Very hard to hard gray brown fine sand CLAY	24-24-30 (54)
	10	Boring terminated at 10 ft	4-17-24 (41)
630			
	15		
625			
	20		
620			
	25		
615			
	30		
610			
	35		
605			

GRAPHIC LOG | WATER LEVELS (ft) | SAMPLE TYPE

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90



Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA ENGINEERING AND ENVIRONMENTAL

TEST BORING RECORD SB-38

PROJECT NAME RMG Taxiway B West Rehabilitation | **PROJECT NO.** 10102-2026071

CLIENT Crawford, Murphy & Tilly, Inc. | **LATITUDE** 34.350686

PROJECT LOCATION Rome, Floyd County, Georgia | **LONGITUDE** -85.164008

LOCATION Proposed Pavement | **ELEVATION** 640.0 ft (NAVD88)

DRILLER Auger Tech Drilling, Inc. | **LOGGED BY** FAM

DRILLING METHOD Hollow Stem Auger | **% ENERGY** 87% | **DATE** 03/09/2026

DEPTH TO-WATER ▽ **INITIAL** N/E ▼ **AFTER 24 HOURS** N/M ○ **CAVING** 7'

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	BLOW COUNTS (UNCORRECTED N-VALUE)
		TOPSOIL: TOPSOIL: 5 inches	
		RESIDUUM: RESIDUUM: Stiff to very stiff white tan brown medium to fine sandy CLAY	5-7-8 (15)
635	5		6-8-11 (19)
		PARTIALLY WEATHERED ROCK: Sampled as very hard white tan brown medium to fine sand CLAY with rock fragments	10-15-50/1"
		RESIDUUM: Hard white tan brown medium to fine sand CLAY	21-21-27 (48)
630	10	Boring terminated at 10 ft	
625	15		
620	20		
615	25		
610	30		
605	35		

● N-Value
Plastic/Liquid Limit (%)
▲ Moisture Content (%)
▫ Fines Content (%)

10 20 30 40 50 60 70 80 90

Notes: Boring elevations were interpolated from Floyd County GIS and should be considered approximate
N-values may be exaggerated where rock fragments were present

This information pertains only to this boring and should not be interpreted as being indicative of the site.

APPENDIX C
Laboratory Test Data

LABORATORY TESTING

MOISTURE CONTENT:

The moisture content is the ratio expressed as a percentage of the weight of water in a mass of soil to the weight of the solid particles. This test was conducted in general accordance with ASTM D 2216. A total of 15 moisture contents were performed in this exploration.

SIEVE ANALYSIS:

The sieve analysis consists of passing a soil sample through a series of standard sieve openings. The percentage of soil, by weight, passing the individual sieves is then recorded and generally presented in a graphical format. The percentage of fines passing through the No. 200 sieve is generally considered to represent the amount of silt and clay of the tested soil sample. The sieve analysis tests were conducted in general accordance with ASTM D6913/ D7928 Designation . A total of 2 sieve analyses were performed during this study.

ATTERBERG LIMITS DETERMINATION:

The Atterberg Limits tests were performed in accordance with ASTM D4318 and are different descriptions of the moisture content of fine-grained soils as it transitions between a solid to a liquid-state. For classification purposes the two primary Atterberg Limits used are the plastic limit (PL) and the liquid limit (LL). The plastic index (PI) is also calculated for soil classification.

The plastic limit (PL) is the moisture content at which a soil transitions from being in a semisolid state to a plastic state. The liquid limit (LL) is defined as the moisture content at which a soil transitions from a plastic state to a liquid state. The plasticity index (PI) represents the difference between these two moisture contents. A total of 2 Atterberg Limit tests were performed during this study.

PROCTOR TEST:

Two (2) Modified Proctor compaction tests were performed in general accordance with ASTM D 1557 – Standard Test Methods for Laboratory Compaction of Soil Using Modified Effort to determine the relationship between the soils' maximum dry unit weight and various moisture contents for use in controlling fill placement.

CBR TEST:

Two (2) California Bearing Ratio (CBR) tests were performed in accordance with (ASTM D 1883 – Standard Test Method for CBR (California Bearing Ratio) to determine strength and deflection characteristics of soil correlated with pavement performance to establish design curves for pavement thickness.

Moisture Content (D2216-mass)

Project Name	RMG TaxiwayB East Rehabilitation	Date	3/13/2026
Project Number	10102-2026071	Lab Number	8456

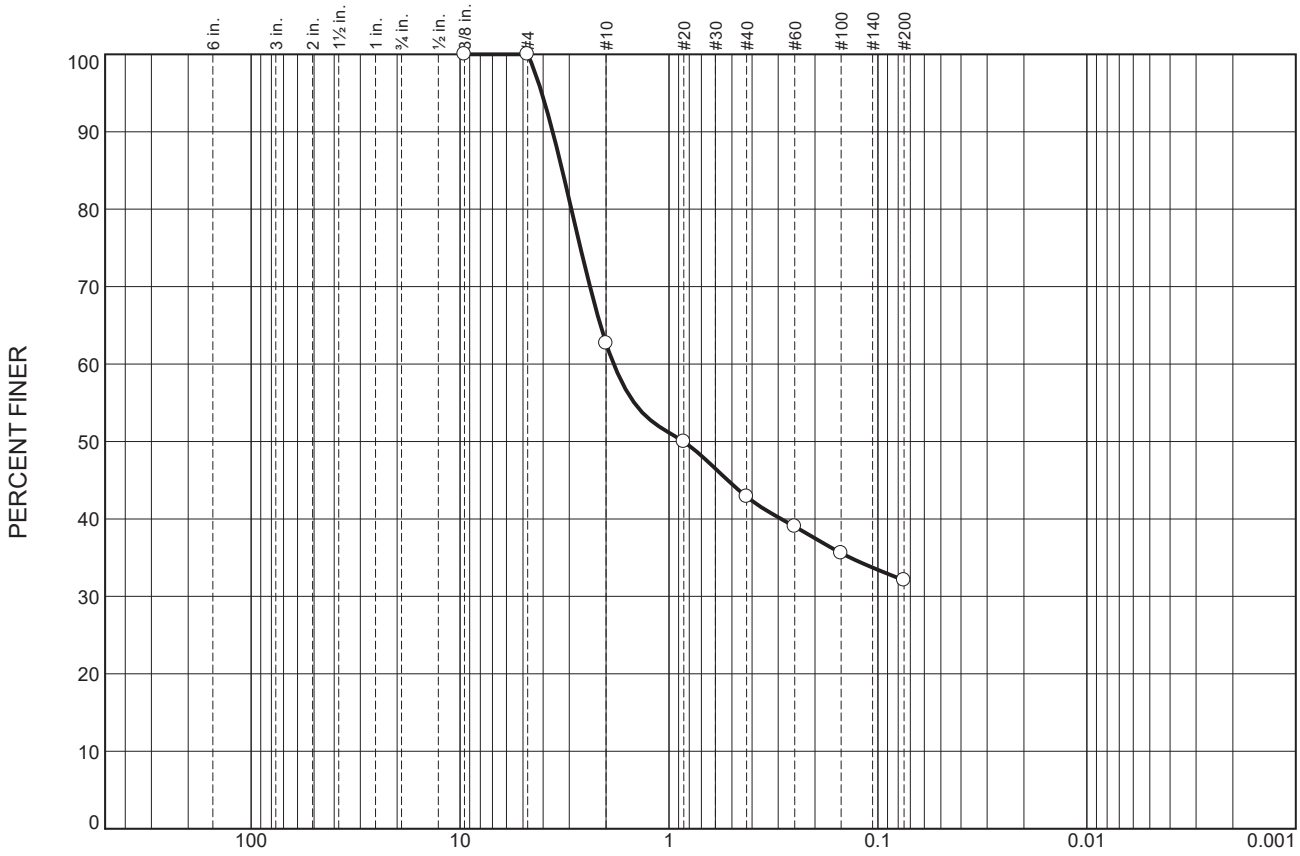
Sample Name	SB-7	SB-8	SB-8	SB-9	SB-10	SB-10	SB-11	SB-22	SB-28	SB-34
Depth	1-2.5	1-2.5	3-5.5	3-5.5	3-5.5	6-7.5	3-5.5	3-5.5	6-7.5	1-2.5
Tare #	MT	SD	VT	MI	DE	WV	CO	CT	DC	FL
WWS&T	323.7	335.2	350.1	312.7	387.6	360.1	446.1	468.3	339.8	440.3
WDS&T	278.9	293.4	295.0	255.9	320.2	315.3	355.0	421.0	281.9	365.3
Tare	7.0	6.9	7.0	7.1	7.0	7.0	7.0	7.1	7.0	7.0
Wwater	44.8	41.8	55.1	56.8	67.4	44.8	91.1	47.3	57.9	75.0
WDS	271.9	286.5	288.0	248.8	313.2	308.3	348.0	413.9	274.9	358.3
Moisture	16.5%	14.6%	19.1%	22.8%	21.5%	14.5%	26.2%	11.4%	21.1%	20.9%

Moisture Content (D2216-mass)

Project Name	RMG TaxiwayB East Rehabilitation	Date	3/13/2026
Project Number	10102-2026071	Lab Number	8456

Sample Name	SB-35	SB-37	SB-38							
Depth	1-2.5	1-2.5	1-2.5							
Tare #	GA	TX	NV							
WWS&T	319.5	368.6	388.2							
WDS&T	263.1	318.0	320.4							
Tare	7.0	7.0	7.0							
Wwater	56.4	50.6	67.8							
WDS	256.1	311.0	313.4							
Moisture	22.0%	16.3%	21.6%							

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	37.3	19.8	10.8	32.1	

SOIL DATA

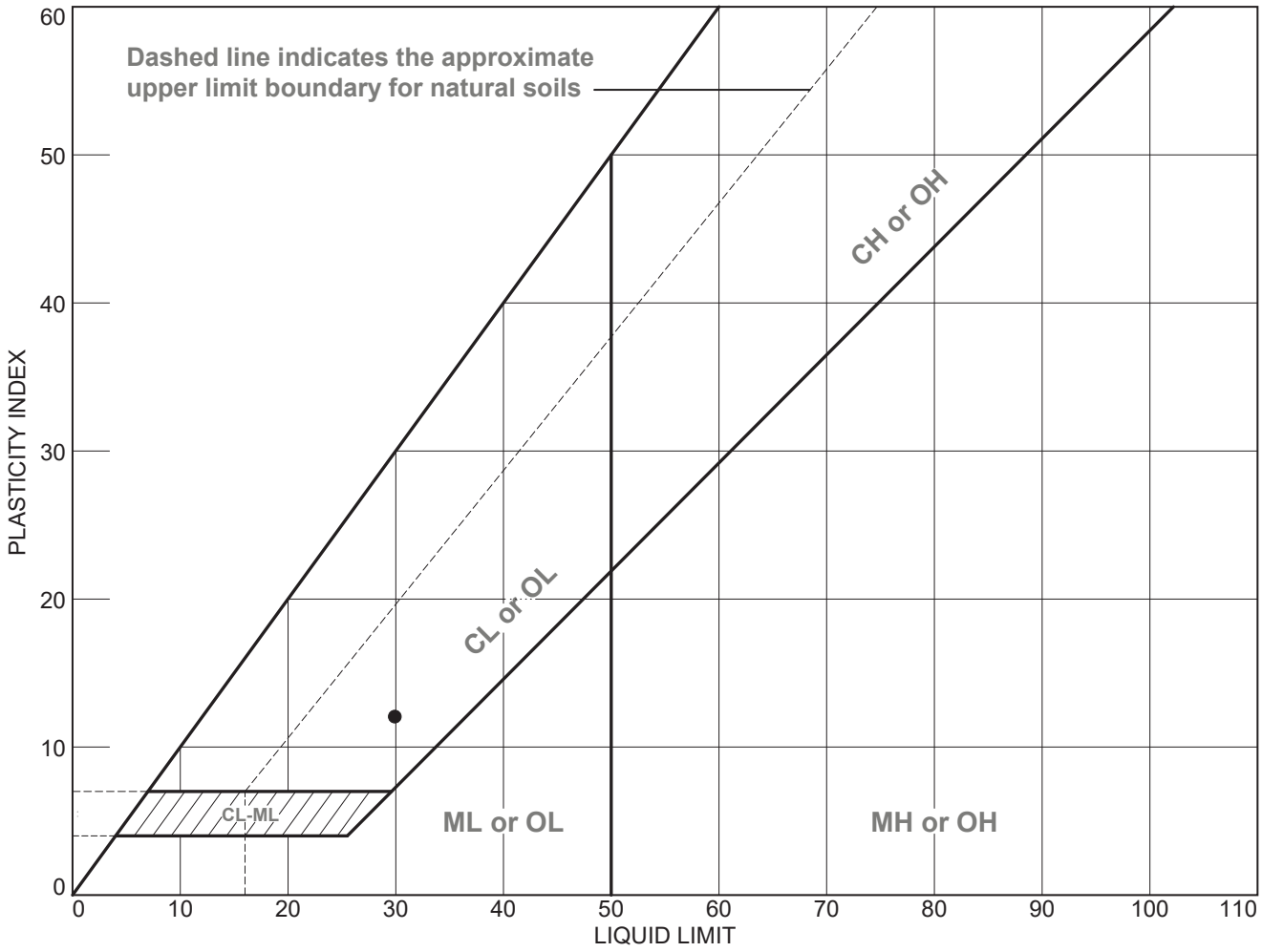
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	AASHTO
○	SB-23	8457	0-5'	Blue-gray/brown clayey sand	A-2-6(0)

Nova Engineering & Environmental
Norcross, GA

Client: Crawford, Murphy & Tilly, Inc.
Project: RMG Taxiway B West Rehabilitation

Project No.: 10102-2026071.000 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	SB-23	8457	0-5'	13.9	18	30	12	SC

Nova Engineering & Environmental
Norcross, GA

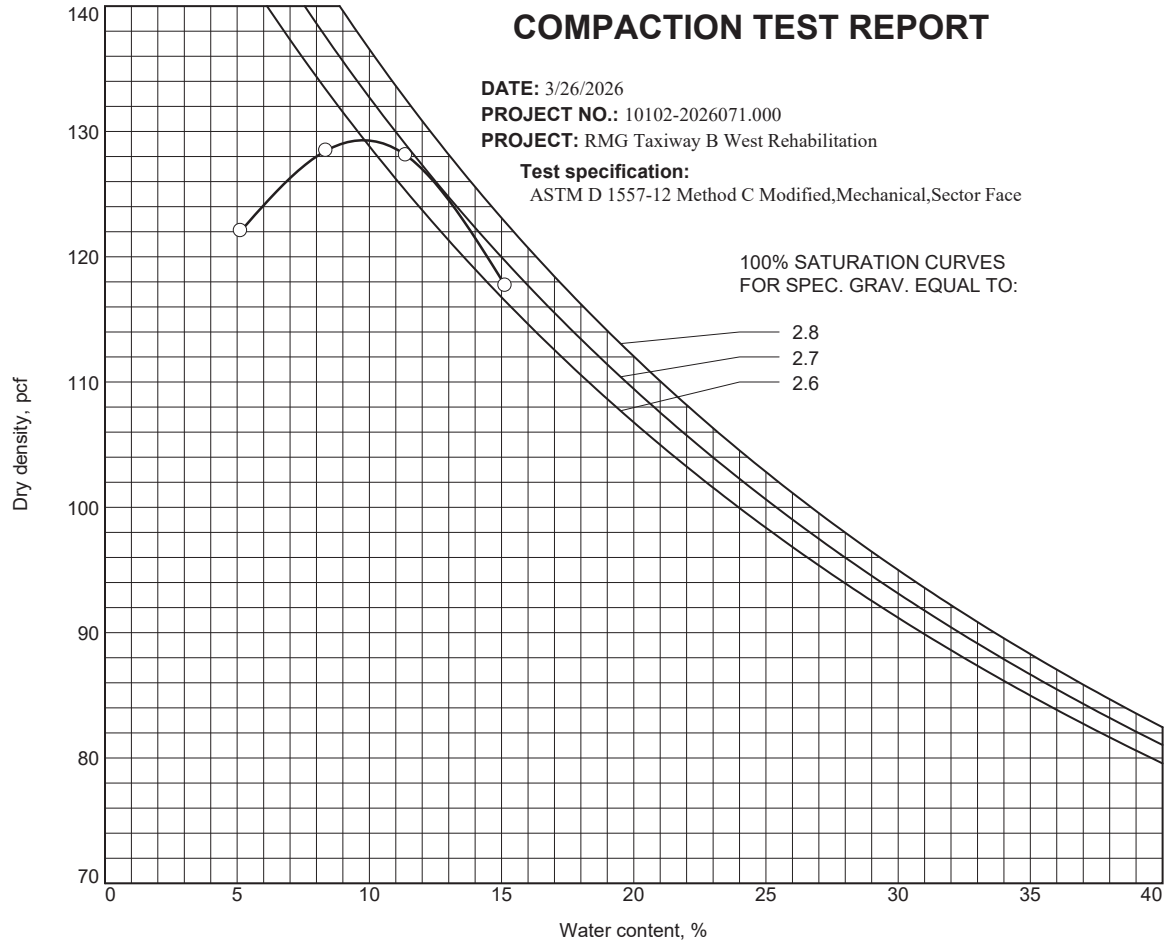
Client: Crawford, Murphy & Tilly, Inc.
Project: RMG Taxiway B West Rehabilitation

Project No.: 10102-2026071.000 **Figure**

COMPACTION TEST REPORT

DATE: 3/26/2026
PROJECT NO.: 10102-2026071.000
PROJECT: RMG Taxiway B West Rehabilitation

Test specification:
ASTM D 1557-12 Method C Modified,Mechanical,Sector Face



	Sample No.	Elev. or Depth	Material Description	Specific Gravity	LL	PL	Oversize	% < #200
○	8457	0-5'	Blue-gray/brown clayey sand		30	18	%>3/4 in.=0	32.1

Sample No.	8457			
Natural water content, percent	13.9			
Optimum water content, percent	9.8			
Max dry density, pcf	129.3			

Remarks:	Project: RMG Taxiway B West Rehabilitation	Project No.: 10102-2026071.000
	Location:	304 Russell Field Road NE
	Source:	SB-23
	Nova Engineering & Environmental	
Figure	**Norcross, GA**	

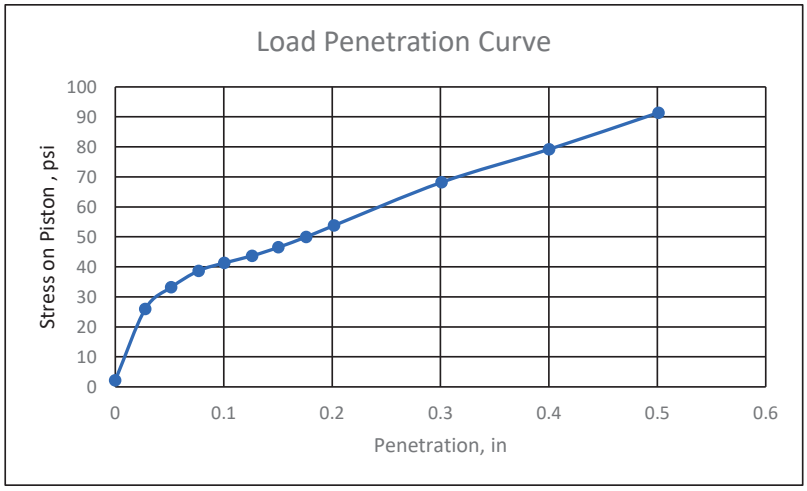
1859 Beaver Ridge Circle, Suite B - Norcross, Georgia 30071
Office Number: (770) 696-1414
Fax Number: (770) 864 - 9963

CBR of Laboratory Compacted Samples ASTM D1883, AAHSTO T193

Project Name	**RMG TAXIWAY B**	**Test Date**	3/21/2026
Project Number	**10102-2026071**	**Sample Name**	SB-23
Client Name	**Crawford, Murphy & Tilly, Inc.**		
Sample Type	**Remolded**	**Max. Dry Density (PCF)**	129.6
Proctor Method	**D1557**	**Optimum Moisture (%)**	10
Specified % Compaction	95		
Specified Moisture	10.0		

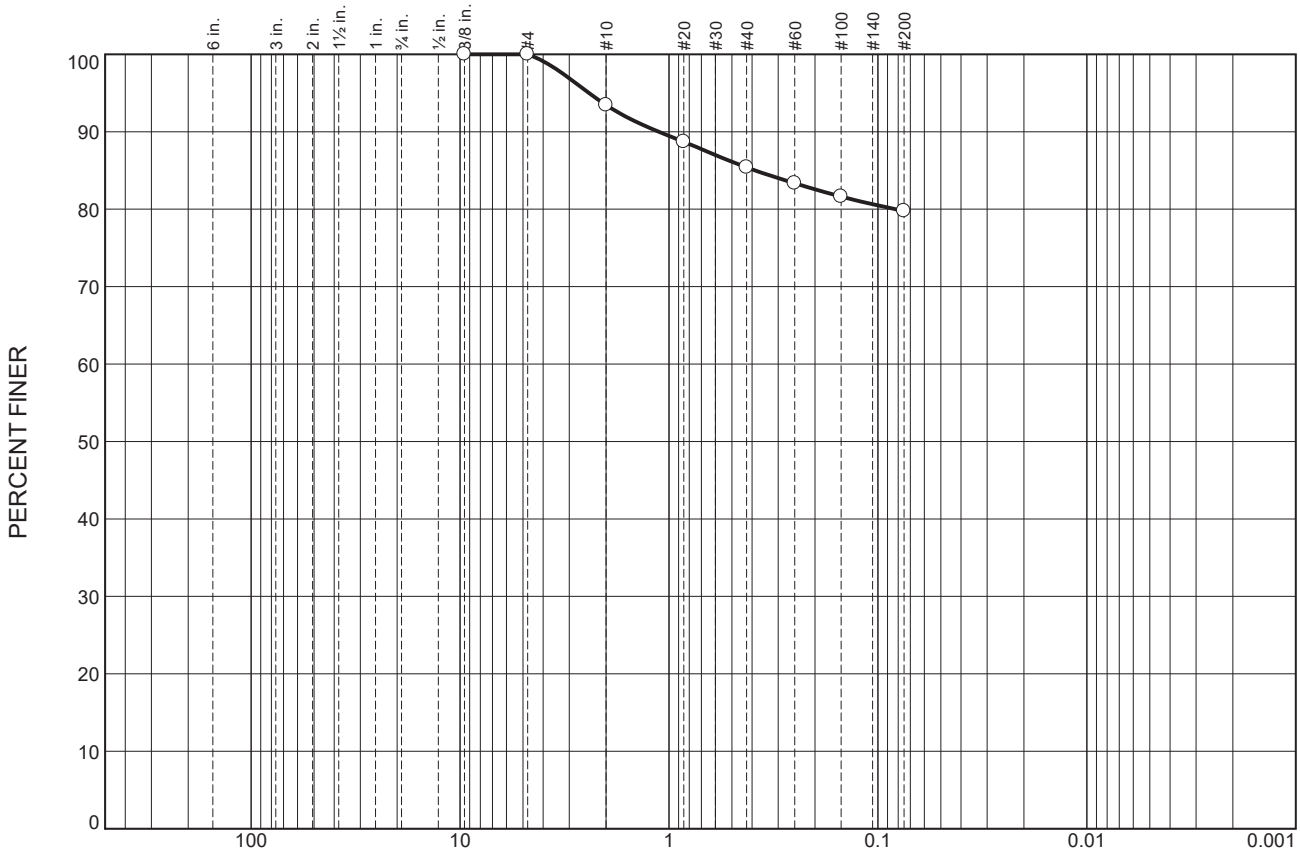
Compacted Sample Data

Pecent of Sample Retained on 3/4 inch Sieve	2.5		
Dry Density Pre Soak(PCF)	124.5		
% Compaction	101.1	**Surcharge Used (lbs)**	10
Moisture Content (%)	8.8	**Swell %**	2.5
Condition of Sample	Soaked		
Soaking Duration (HR)	96		
Moisture Content(%) after Soak and Penetration (Top 1 in.)			15.8
Dry Density Post Soak (PCF)			119.9



Corrected CBR at 0.100 in	4.1
Corrected CBR at 0.200 in	3.6
Peak Stress PSI	91.4

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	6.6	8.0	5.6	79.8	

SOIL DATA

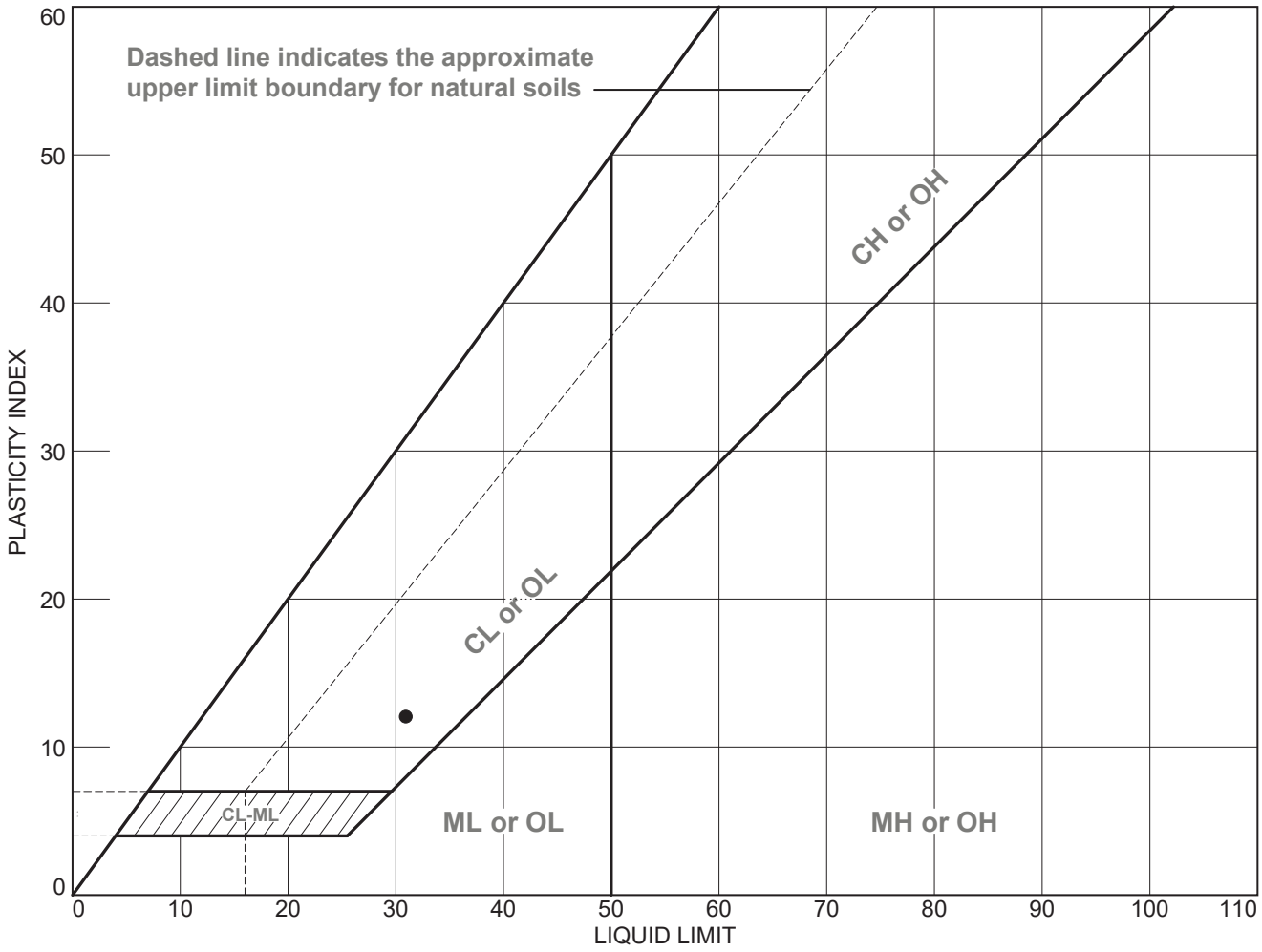
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	AASHTO
○	SB-26	8458	0-5'	Tan/yelllow-brown lean clay with sand	A-6(8)

Nova Engineering & Environmental
Norcross, GA

Client: Crawford, Murphy & Tilly, Inc.
Project: RMG Taxiway B West Rehabilitation

Project No.: 10102-2026071.000 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	SB-26	8458	0-5'	27.0	19	31	12	CL

Nova Engineering & Environmental
Norcross, GA

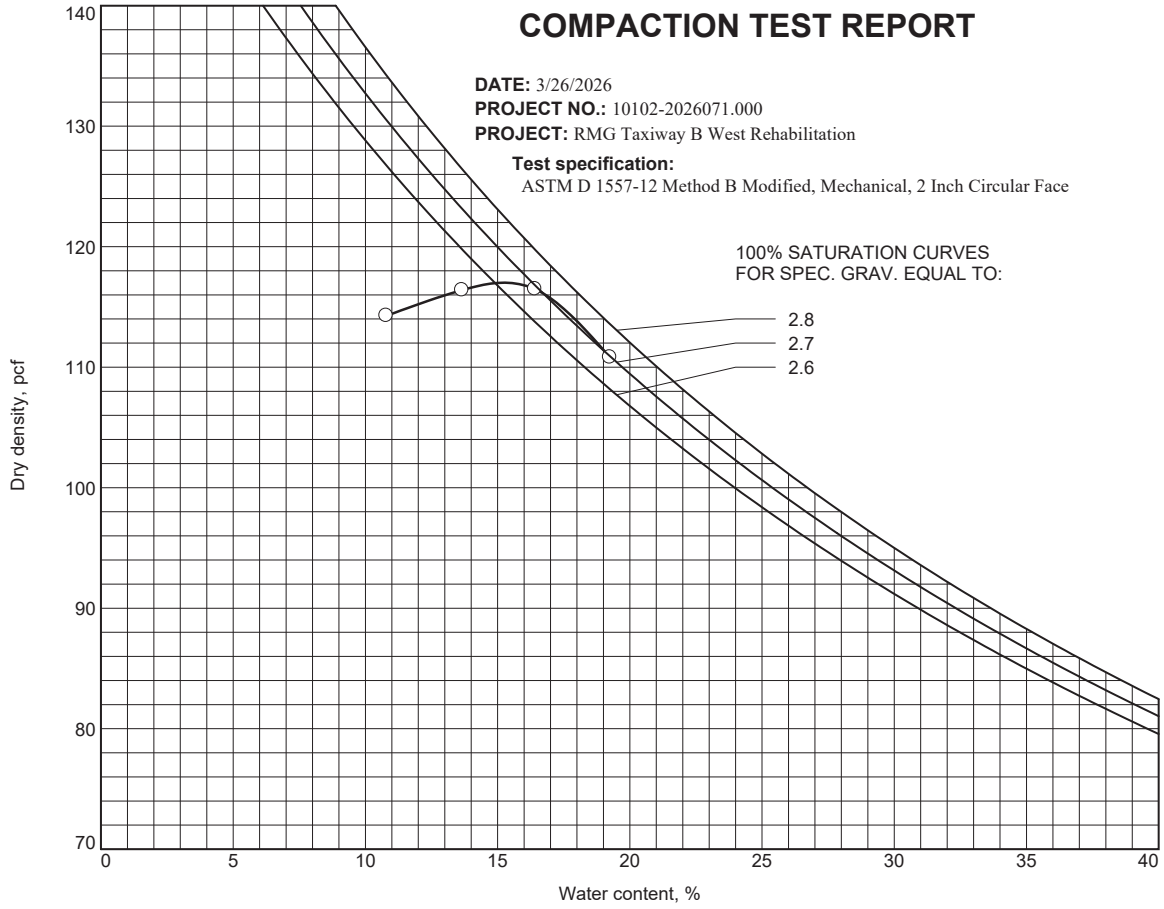
Client: Crawford, Murphy & Tilly, Inc.
Project: RMG Taxiway B West Rehabilitation

Project No.: 10102-2026071.000 **Figure**

COMPACTION TEST REPORT

DATE: 3/26/2026
PROJECT NO.: 10102-2026071.000
PROJECT: RMG Taxiway B West Rehabilitation

Test specification:
ASTM D 1557-12 Method B Modified, Mechanical, 2 Inch Circular Face



	Sample No.	Elev. or Depth	Material Description	Specific Gravity	LL	PL	Oversize	% < #200
○	8458	0-5'	Tan/yelllow-brown lean clay with sand		31	19	%>3/8 in.=0.0	79.8

Sample No.	8458			
Natural water content, percent	27.0			
Optimum water content, percent	15.3			
Max dry density, pcf	117.0			

Remarks:	Project: RMG Taxiway B West Rehabilitation	Project No.: 10102-2026071.000
	Location: 304 Russell Field Road NE	
	Source: SB-26	
	Nova Engineering & Environmental	
Figure	**Norcross, GA**	

Tested By: Eric

1859 Beaver Ridge Circle, Suite B - Norcross, Georgia 30071
Office Number: (770) 696-1414
Fax Number: (770) 864 - 9963

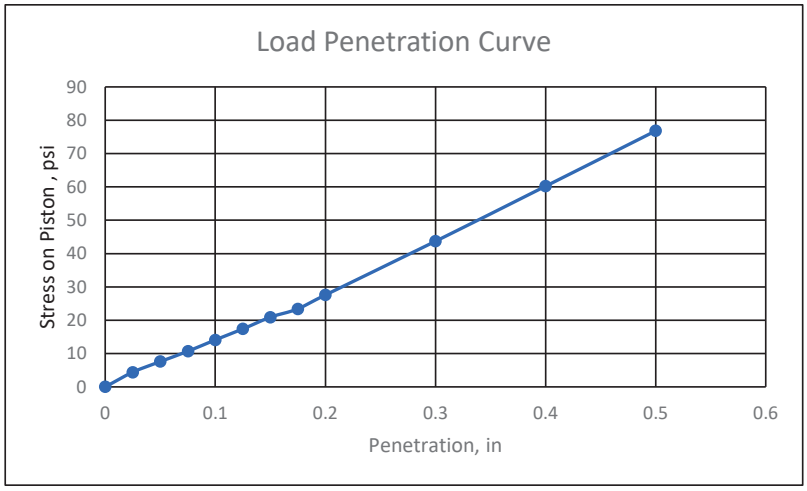
CBR of Laboratory Compacted Samples ASTM D1883, AAHSTO T193

Project Name	**RMG TXWY B**	**Test Date**	3/23/2026
Project Number	**10102-2026071**	**Sample Name**	SB-26
Client Name	**Crawford, Murphy & Tilly, Inc.**		
Sample Type	**Remolded**	**Max. Dry Density (PCF)**	116.7
Proctor Method	**D1557**	**Optimum Moisture (%)**	15.8
Specified % Compaction	95		
Specified Moisture	15.8		

Compacted Sample Data

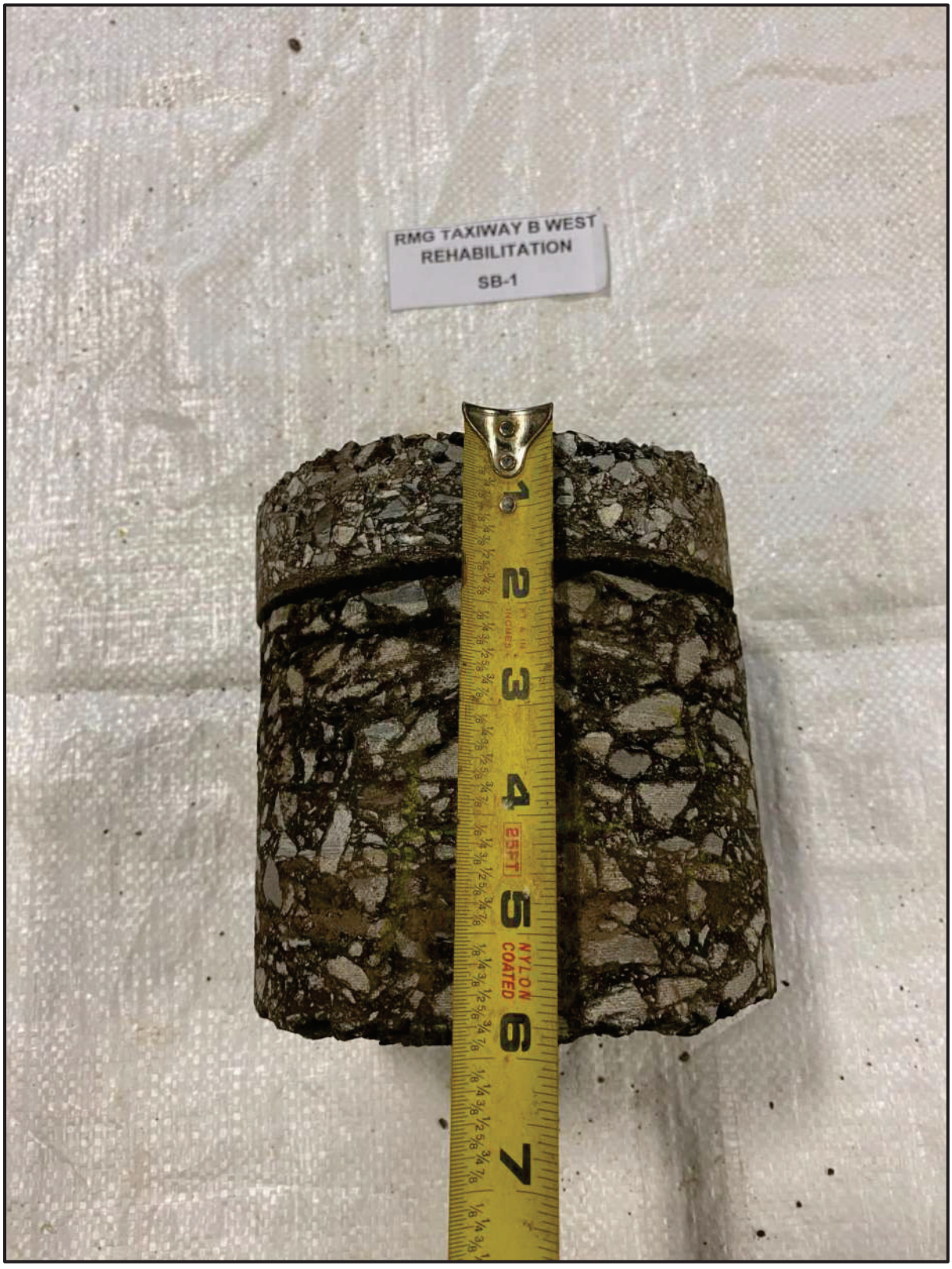
Pecent of Sample Retained on 3/4 inch Sieve 0

Dry Density Pre Soak(PCF)	115.1		
% Compaction	103.9	**Surcharge Used (lbs)**	10
Moisture Content (%)	13.9	**Swell %**	3.5
Condition of Sample	Soaked		
Soaking Duration (HR)	96		
Moisture Content(%) after Soak and Penetration (Top 1 in.)			22.4
Dry Density Post Soak (PCF)			104.8



Corrected CBR at 0.100 in	1.4
Corrected CBR at 0.200 in	1.8
Peak Stress PSI	76.8

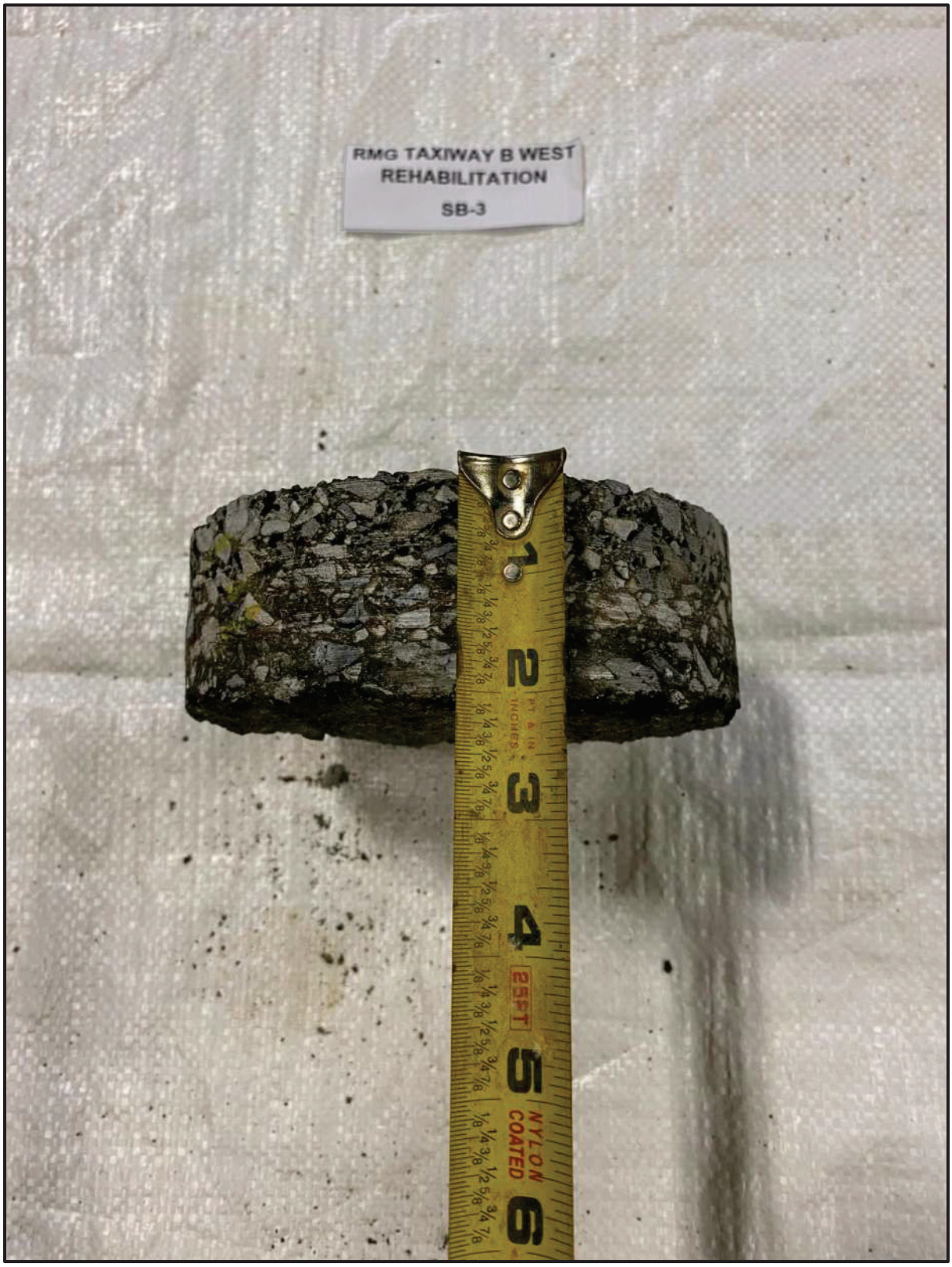
APPENDIX D
Core Photo Log



CORE COLLECTED FROM SB-1

RMG TAXIWAY B WEST REHABILITATION
SB-2

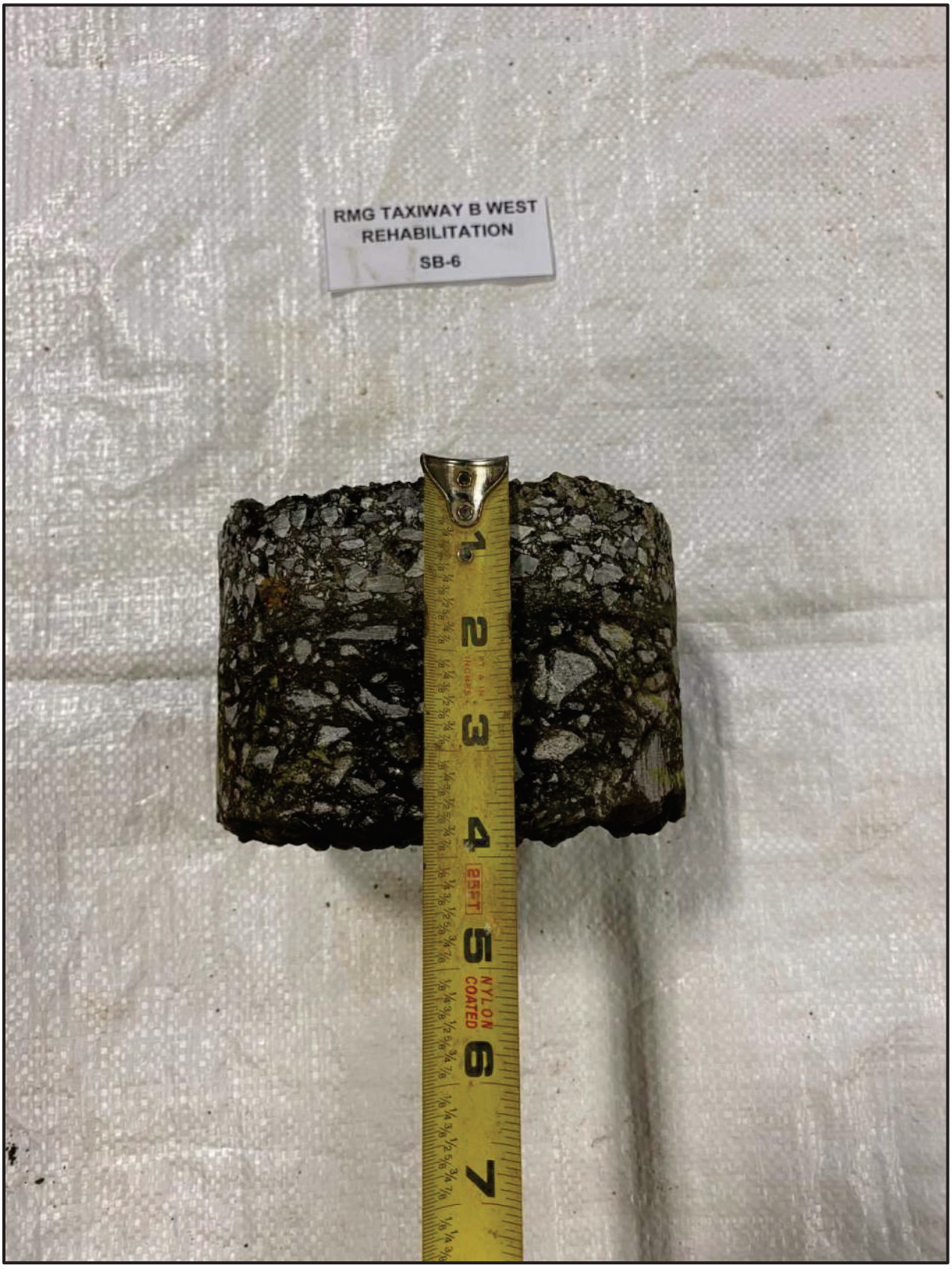
CORE COLLECTED FROM SB-2: BOTTOM-UP CRACK; 3”



CORE COLLECTED FROM SB-3

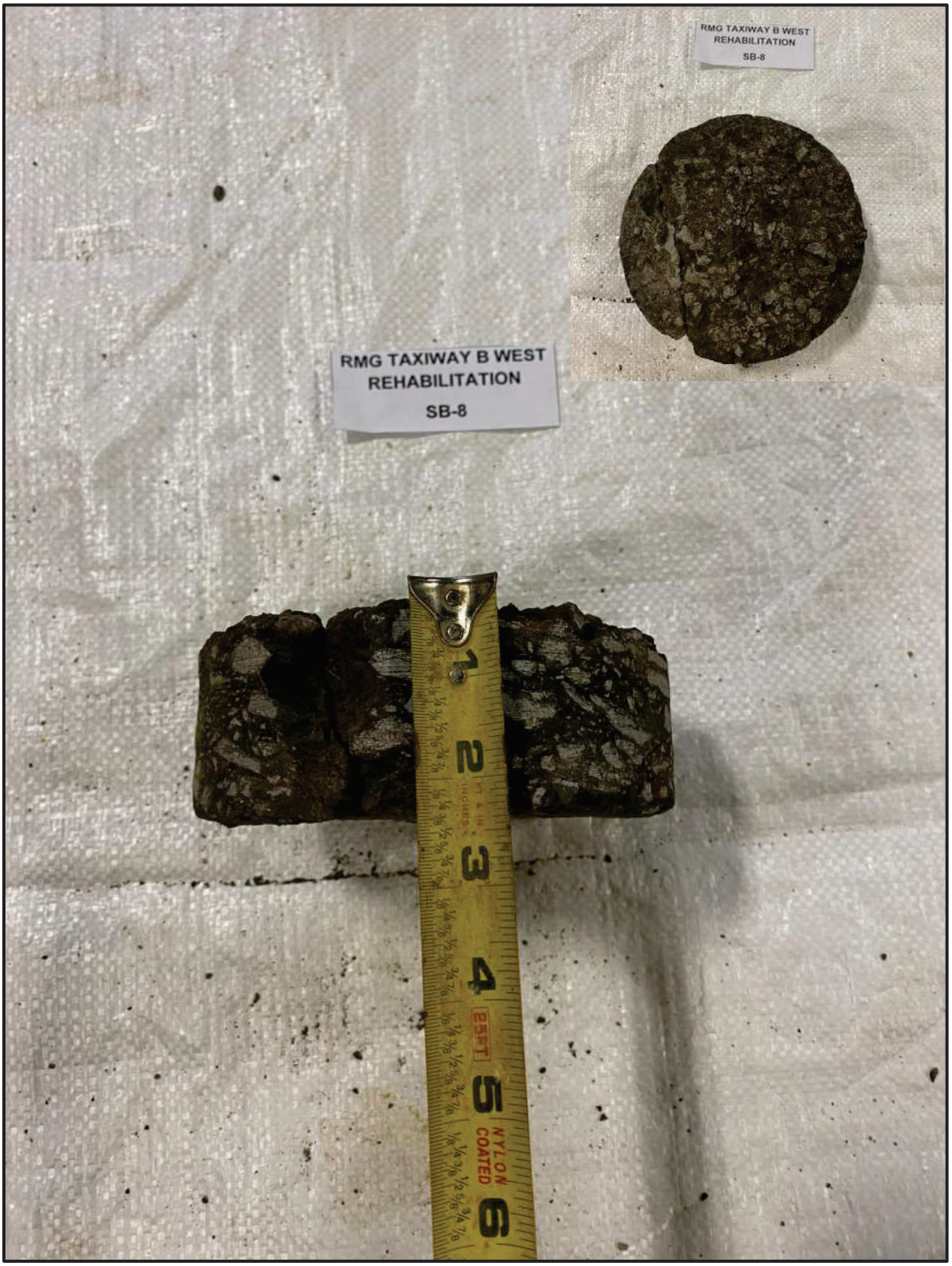
CORE COLLECTED FROM SB-4: TOP-DOWN CRACK; 2"

CORE COLLECTED FROM SB-5



CORE COLLECTED FROM SB-6

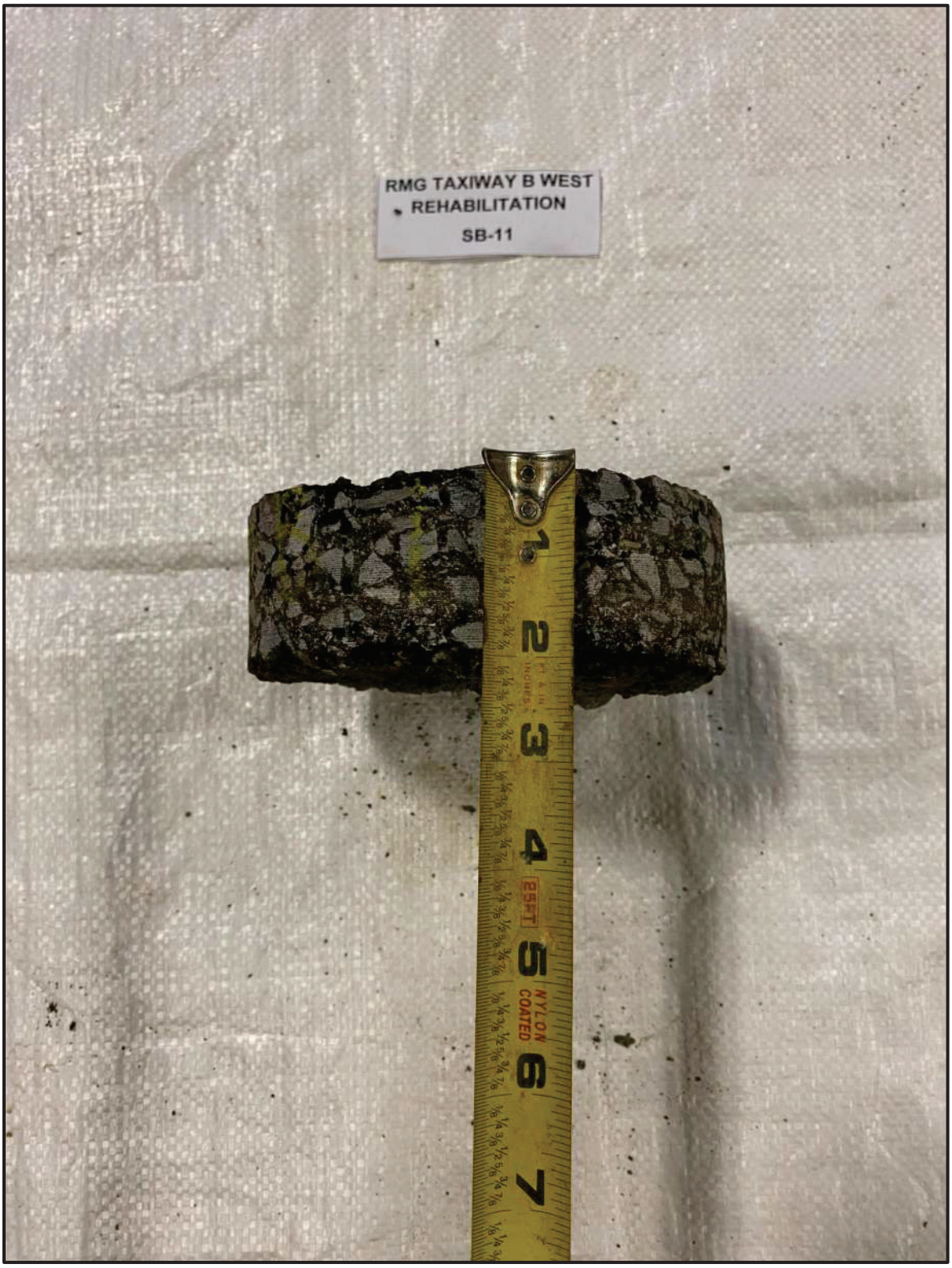
CORE COLLECTED FROM SB-7



CORE COLLECTED FROM SB-8: TOP-DOWN CRACK; 2"

CORE COLLECTED FROM SB-9

CORE COLLECTED FROM SB-10



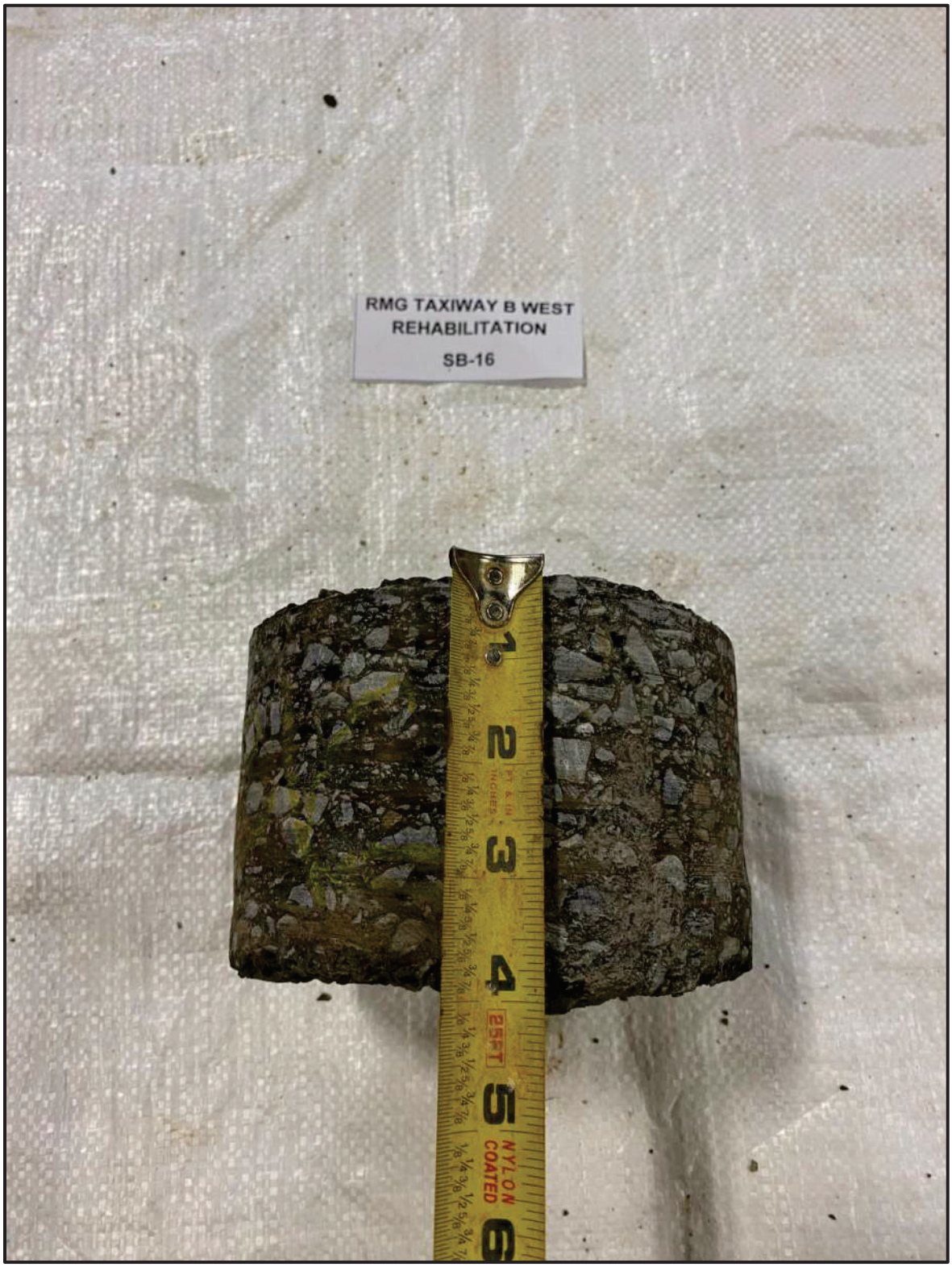
CORE COLLECTED FROM SB-11

CORE COLLECTED FROM SB-12

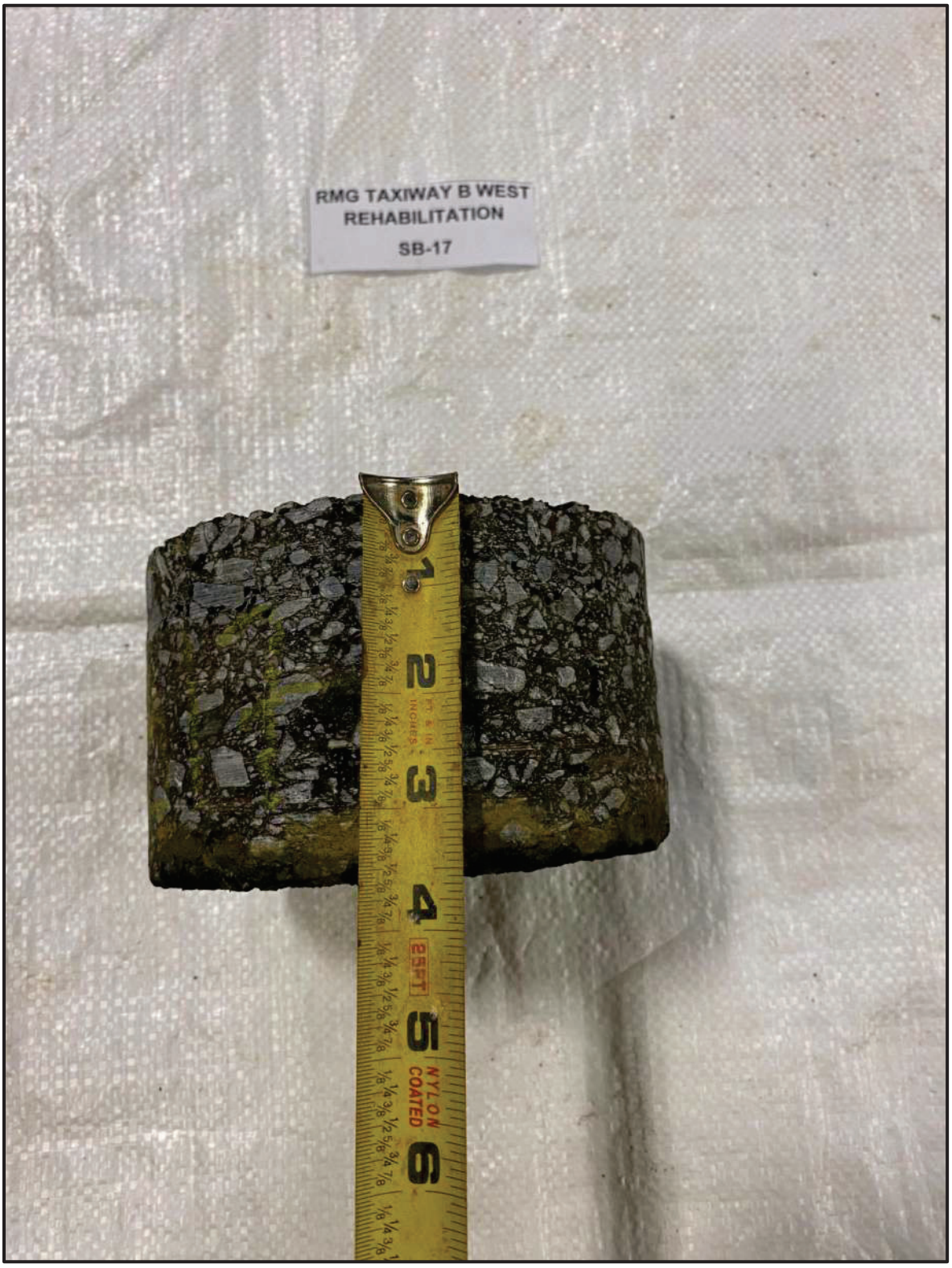
CORE COLLECTED FROM SB-13

CORE COLLECTED FROM SB-14

CORE COLLECTED FROM SB-15



CORE COLLECTED FROM SB-16



CORE COLLECTED FROM SB-17

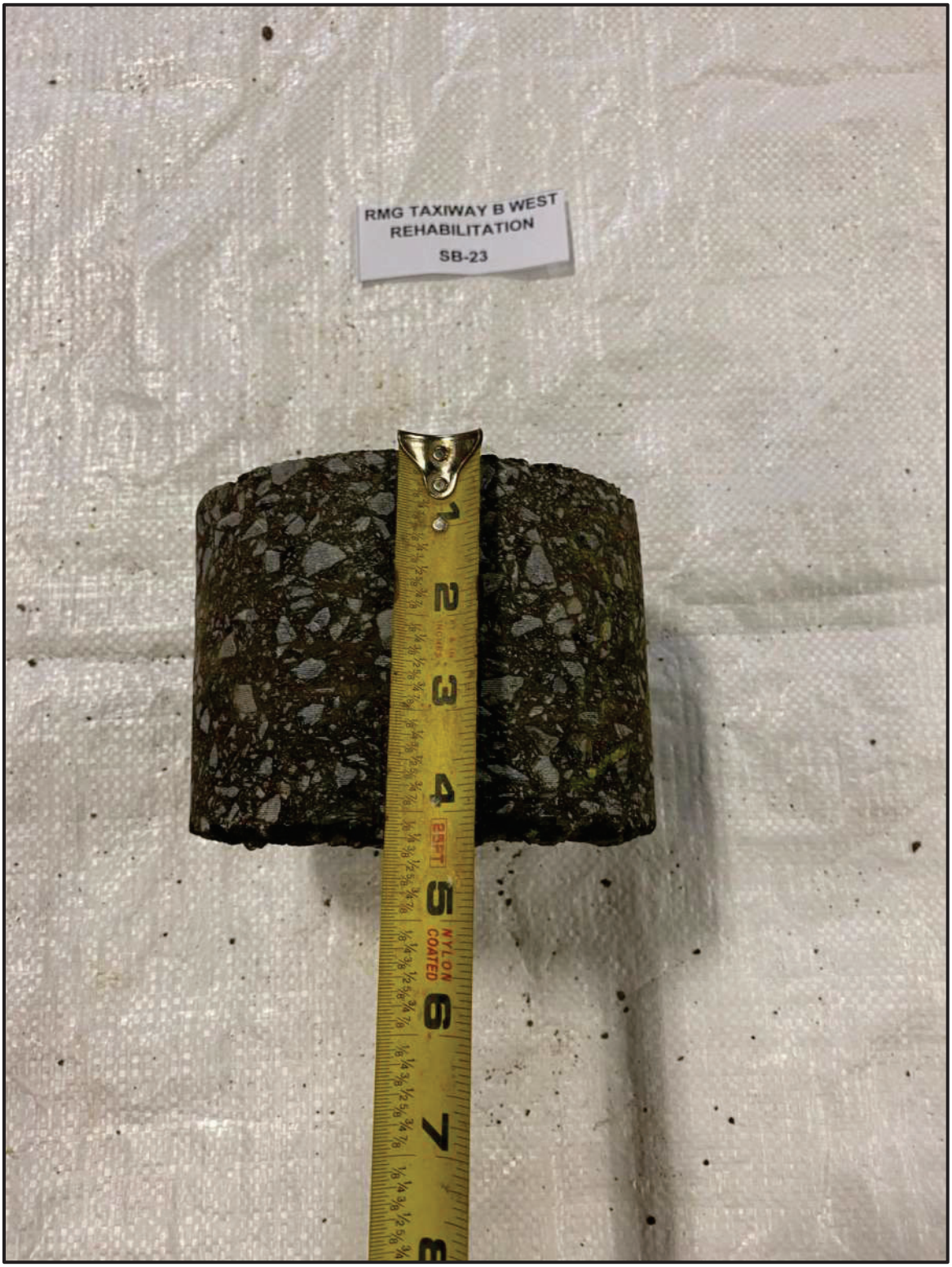
CORE COLLECTED FROM SB-18

CORE COLLECTED FROM SB-19

CORE COLLECTED FROM SB-20

CORE COLLECTED FROM SB-21

CORE COLLECTED FROM SB-22



CORE COLLECTED FROM SB-23

CORE COLLECTED FROM SB-36

APPENDIX E
Visual Distress Photo Log

RMG TAXIWAY B WEST REHABILITATION – VISUAL DISTRESS PHOTO LOG
NOVA PROJECT NUMBER: 10102-2026071
Rome, Floyd County, Georgia
April 27, 2026

MAP OF VISUAL DISTRESS PHOTOGRAPH LOCATIONS

PHOTOGRAPH P-1 (SB-1): MODERATE SEVERITY FATIGUE CRACKING; LOW SEVERITY LONGITUDINAL CRACKING

P-1 is the location of the photo

PHOTOGRAPH P-2 (SB-2): LOW SEVERITY TRANSVERSE BLOCK CRACKING; LOW SEVERITY LONGITUDINAL CRACKING

P-2 is the location of the photo

PHOTOGRAPH P-3 (SB-3): MODERATE SEVERITY RAVELING; LOW SEVERITY FLUSHING

P-3 is the location of the photo

PHOTOGRAPH P-4 (SB-4): MODERATE SEVERITY PATCHING; LOW SEVERITY RAVELING

P-4 is the location of the photo

PHOTOGRAPH P-5 (SB-5) HIGH SEVERITY FATIGUE CRACKING; WEEDS GROWING THROUGH CRACKS

P-5 is the location of the photo

PHOTOGRAPH P-6 (SB-6): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; MODERATE SEVERITY TRANSVERSE BLOCK CRACKING;

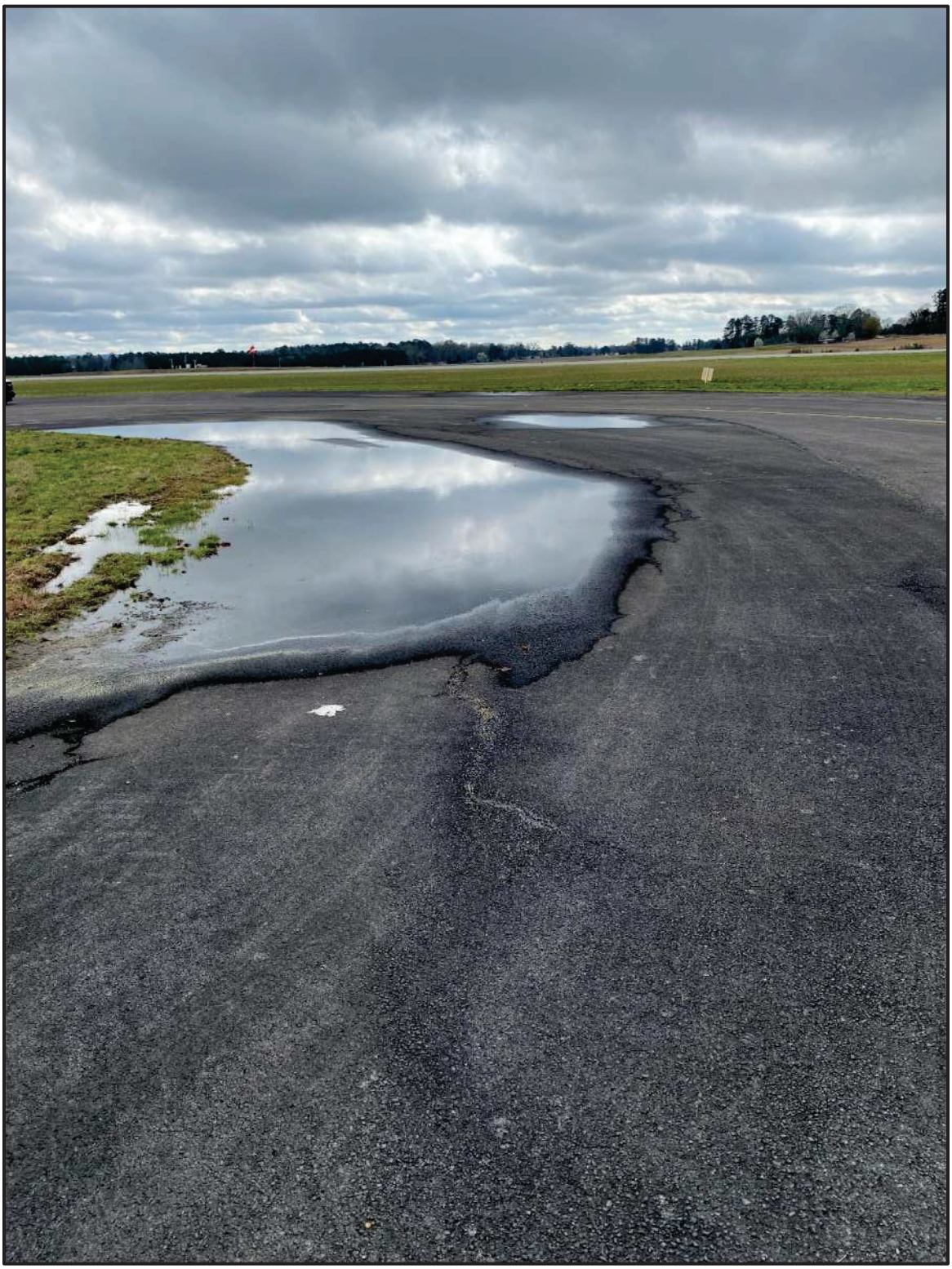
P-6 is the location of the photo

PHOTOGRAPH P-7 (SB-7): HIGH SEVERITY FATIGUE CRACKING; LOW SEVERITY RAVELING

P-7 is the location of the photo

PHOTOGRAPH P-8 (SB-8): HIGH SEVERITY LONGITUDINAL CRACKING; MODERATE SEVERITY TRANSVERSE BLOCK CRACKING

P-8 is the location of the photo

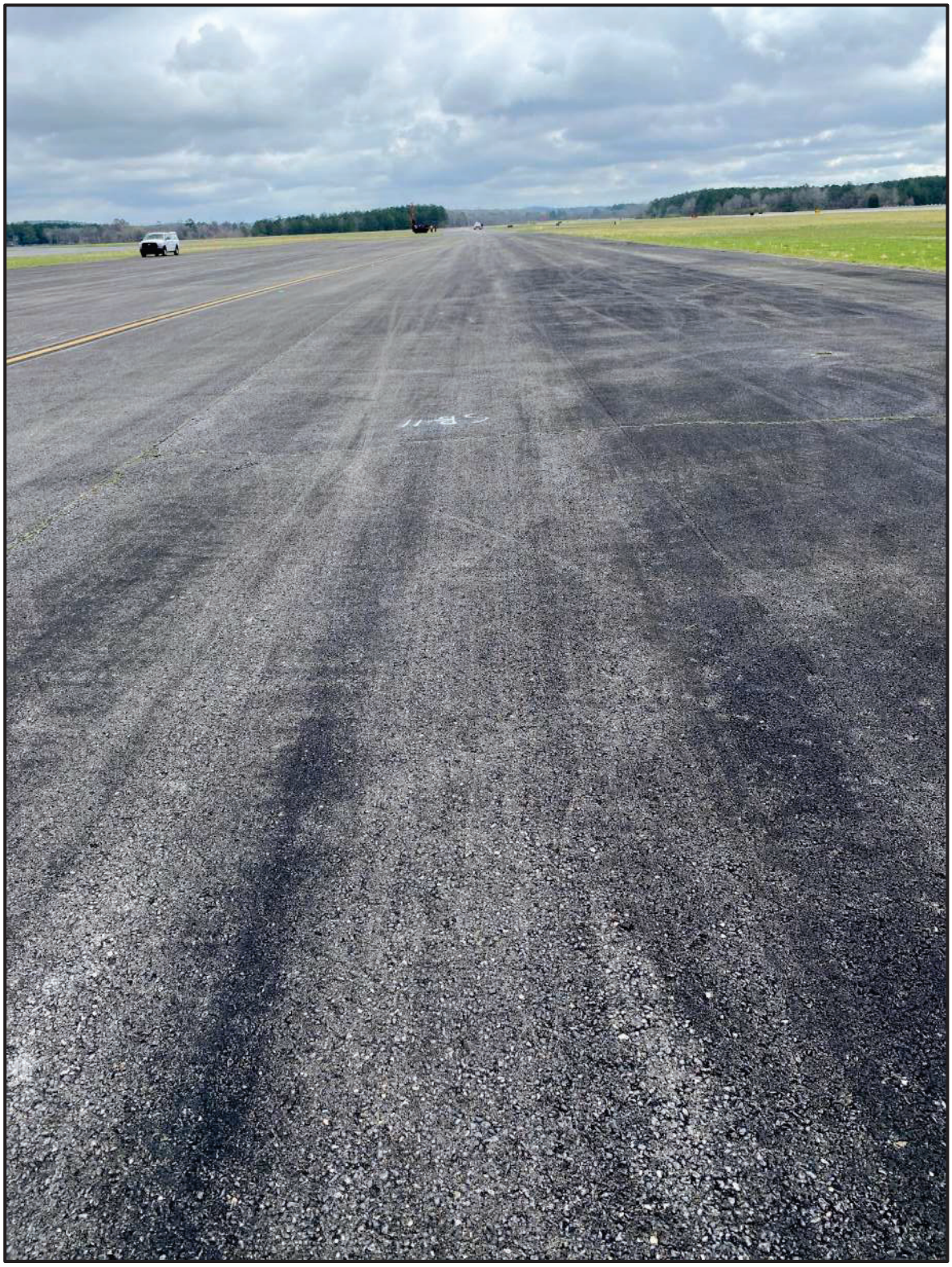


PHOTOGRAPH P-9 (SB-9): MODERATE SEVERITY FLUSHING; WATER STANDING ON PAVEMENT

P-9 is the location of the photo

PHOTOGRAPH P-10 (SB-10): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; MODERATE SEVERITY TRANSVERSE CRACKING; WEEDS GROWING THROUGH CRACKS

P-10 is the location of the photo



PHOTOGRAPH P-11 (SB-11): MODERATE SEVERITY FLUSHING; LOW SEVERITY RAVELING

P-11 is the location of the photo

PHOTOGRAPH P-12 (SB-12): MODERATE SEVERITY TRANSVERSE BLOCK CRACKING; MODERATE SEVERITY FLUSHING

P-12 is the location of the photo

PHOTOGRAPH P-13 (SB-13): MODERATE SEVERITY PAVING SEAM LONGITUDINAL CRACKING; LOW SEVERITY FLUSHING; WEEDS GROWING THROUGH CRACKS

P-13 is the location of the photo

PHOTOGRAPH P-14 (SB-14): MODERATE SEVERITY FLUSHING

P-14 is the location of the photo

PHOTOGRAPH P-15 (SB-15): HIGH SEVERITY TRANSVERSE CRACKING; WEEDS GROWING THROUGH CRACKS

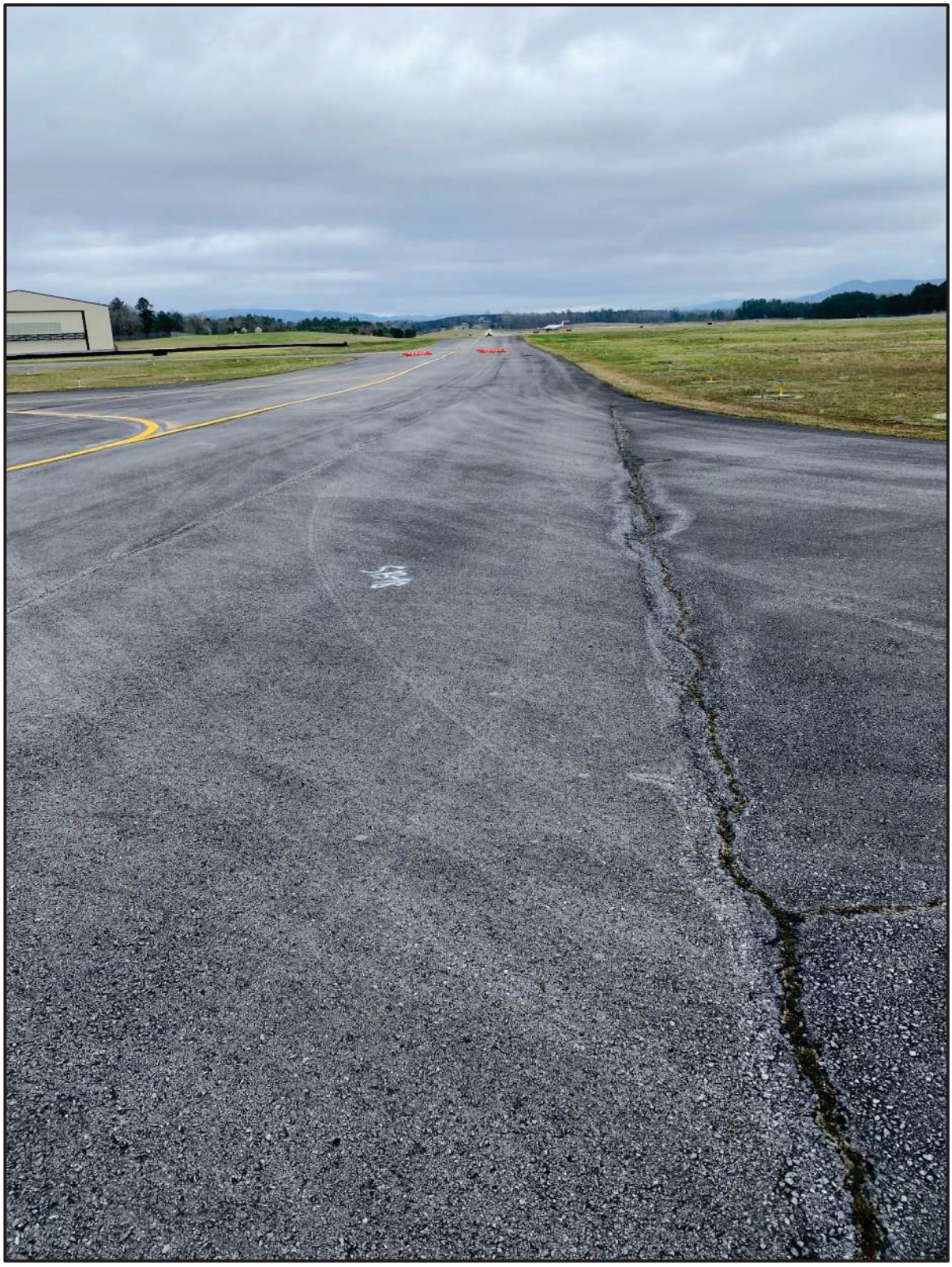
P-15 is the location of the photo

PHOTOGRAPH P-16 (SB-16): LOW SEVERITY FLUSHING

P-16 is the location of the photo

PHOTOGRAPH P-17 (B-17): MODERATE SEVERITY PAVING SEAM LONGITUDINAL CRACKING

P-17 is the location of the photo

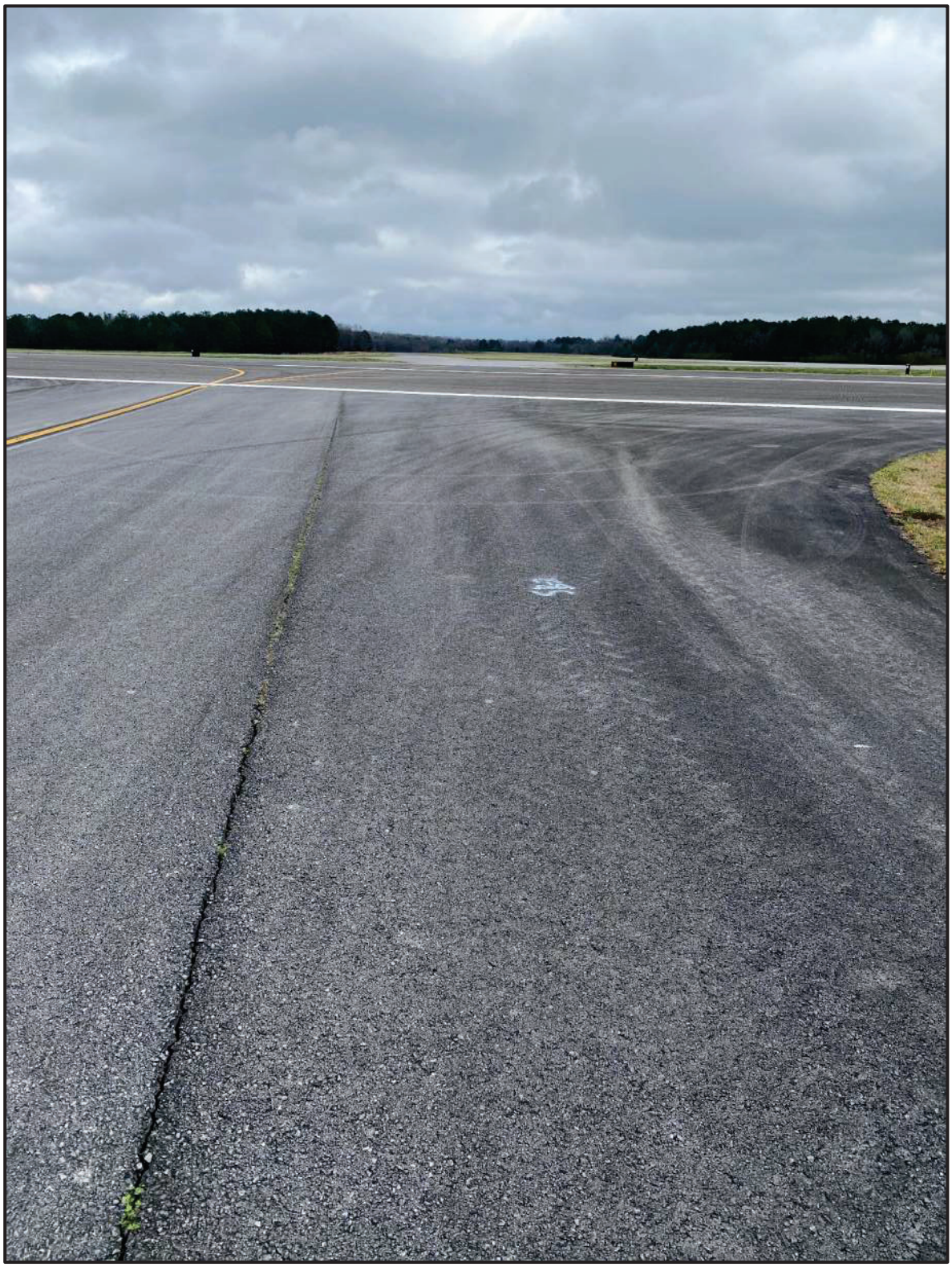


PHOTOGRAPH P-18 (SB-18): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING

P-18 is the location of the photo

PHOTOGRAPH P-19 (SB-19): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; WEEDS GROWING THROUGH CRACKS

P-19 is the location of the photo



PHOTOGRAPH P-20 (SB-20): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; WEEDS GROWING THROUGH CRACKS

P-20 is the location of the photo

PHOTOGRAPH P-21 (SB-21): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; MODERATE SEVERITY TRANSVERSE BLOCK CRACKING; LOW SEVERITY RAVELING; WEEDS GROWING THROUGH CRACKS

P-21 is the location of the photo

PHOTOGRAPH P-22 (SB-22): MODERATE SEVERITY PAVING SEAM LONGITUDINAL CRACKING; MODERATE SEVERITY LONGITUDINAL CRACKING

P-22 is the location of the photo

PHOTOGRAPH P-23 (SB-23): HIGH SEVERITY PAVING SEAM LONGITUDINAL CRACKING; MODERATE SEVERITY TRANSVERSE CRACKING

P-23 is the location of the photo

PHOTOGRAPH P-24 (SB-36): MODERATE SEVERITY RAVELING

P-24 is the location of the photo

APPENDIX F
Qualifications of Recommendations

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our on-site services and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the exploration and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to document that the conditions anticipated in this exploration actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of CLIENT only. The scope of services performed during this exploration was developed for purposes specifically intended by CLIENT and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Georgia. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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