CONTRACT DOCUMENTS AND SPECIFICATIONS

for

Multi-Unit Hangar Development, Phase 1
March 2025
WK Dickson No. 20240744.00.WK
NCDOT-DOA Project No. 36237.4.19.1

Prepared for

Town of Elizabethtown
805 West Broad Street
Elizabethtown, NC 28337

Engineer's Seal

Plans & Specifications
Prepared by
W.K. Dickson & Co., LLC
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WK DICKSON
AN ARDURRA COMPANY

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TABLE OF CONTENTS

DIVISION II
GENERAL PROVISIONS

DIVISION III
SPECIAL PROVISIONS

DIVISION IV
TECHNICAL SPECIFICATIONS

DIVISION I

CONTRACT REQUIREMENTS

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Advertisement for Bids

Multi-unit Hangar Development, Phase 1

Curtis L. Brown, Jr. Field (EYF)
Elizabethtown, North Carolina

Sealed proposals will be received by the Town of Elizabethtown in the Terminal Building, of the Curtis L. Brown, Jr. Field Airport, 466 Airport Rd, Elizabethtown, NC 28337, up to 2:00 PM, April 2, 2025, and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment for Multi-Unit Hangar Development, Ph 1 Project.

Project scope shall generally consist of: Construction of new 9,600-SF hangar building and associated apron, including items such as erosion sediment control measures, grading/earthwork, airfield pavement, airfield pavement markings, hangar building construction, and utility connections.

A Pre-Bid Conference has been scheduled for Wednesday, March 19, 2025 at 11:00 AM, local time at the Curtis L. Brown, Jr. Field Airport terminal building. Attendance at this Pre-Bid Conference is non-mandatory for all bidders intending to submit a prime bid on this project. A sign-in sheet shall be completed by each attendee at the Pre-Bid Meeting as evidence of attendance. All other interested parties including, but not limited to, subcontractors, suppliers, and vendors are welcome to attend.

It is anticipated that the contract award will be made to the lowest responsive and responsible bidder if an award is made.

Proposals must be submitted in sealed envelopes with the Bidder's name, full mailing address, and General Contractor License Number shown as the return address. Sealed envelopes shall be addressed to:

Town of Elizabethtown
Dane Rideout, Town Manager
466 Airport Rd.
Elizabethtown, NC 28337

Proposals submitted without the prescribed information may be rejected.

All Bidders should be aware that the date, time, and location for Proposal Submittal and Opening may be modified by Addendum.

Plans, Specifications and Contract Documents may be examined at: W.K. Dickson & Co., LLC 720 Corporate Center Drive, Raleigh, NC 27607. Plans, Specifications, and Contract Documents are available for purchase by going to Plan Room at www.wkdickson.com. Please note that only registered plan holders may bid as a General Contractor.

All Contractors are hereby notified that they must have proper licenses under the state law for their trades. General Contractors are notified that applicable statues of North Carolina will be observed in receiving and awarding general contracts.

The State Department of Transportation and the United States Government have agreed to reimburse the Owner for portions of the project costs. The Owner will not accept or consider proposals from any contractor whose name, at the time of opening of bids or award, appears on the current list of ineligible contractors published by the Comptroller General of the United States under Section 5.6 (b) of the Regulations of the Secretary of Labor (29) CFR nor a proposal from any firm, corporation, partnership, or proprietorship in which an ineligible contractor who, at the time of the opening of bids or the award, is removed from the North Carolina Department of Transportation's list of prequalified contractors.

Contractors desiring to perform work on NCDOT projects shall pre-qualify with the Department. Upon pre-qualification, Contractors will be placed on the Department's Prequalified Bidders List and/or the Approved Subcontractors List, depending on the application submitted. The requirements for pre-qualification are listed in section 102-2 of the Standard Specifications for Roads and Structures, latest edition. For more information please refer to the NCDOT website at https://connect.ncdot.gov/business/Prequal/Pages/default.aspx

All bidders must be prequalified by the NCDOT as a "Bidder" prior to submitting a bid and all Contractors and Subcontractors must be prequalified as a "Bidder" or "Subcontractor" prior to performing any work on this project.

Each proposal shall be accompanied by a cash deposit or a certified check drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation in an amount equal to not less than 5% of the proposal or a bid bond of 5% of the bid executed by a surety company licensed under the laws of North Carolina to execute such bonds. The deposits shall be made payable to the Owner and shall be retained by the Owner as liquidated damages in the event of the successful bidder fails to properly execute the contract within ten (10) days after award and to give satisfactory surety as required by law.

By submitting a bid the Contractor certifies that he has under his direct control or at his disposal the men, equipment, and materials required to execute this work as specified. Lack of such control or availability of men, equipment or materials shall constitute failure to properly execute the Contract. Performance and Labor and Material Payment Bonds will be required for 100% of the Contract price, with a surety or sureties legally authorized to do business in the State of North Carolina.

A bid may be withdrawn only as provided by the applicable statues of North Carolina. If a bid is withdrawn within 120 days of the bid opening, the Bid Guarantee shall be forfeited; provided that, if the request to withdraw is made not later than 72 hours after the opening of bids, and if the withdrawal is allowed, the Owner may return the bid guarantee.

The project is conditioned upon the receipt of federal funding under provisions of the Airport and Airways Safety and Capacity Expansion Act of 1987 and most recently Wendell H. Ford Aviation Investment and Reform Act for 21st Century (AIR-21). Certain mandatory federal requirements apply to this solicitation and will be made part of any contract awarded.

1. Buy American Preference (Title 49 United States Code, Chap 501);

2. Foreign Trade Restriction (49 CFR Part 30);
3. Disadvantaged Business Enterprise (49 CFR Part 26);
4. Davis-Bacon Act (29 CFR Part 5);
5. Equal Employment Opportunity (Executive Order 11246 and 41 CFR Part 60);
6. Goals for Minority and Female Participation (41 CFR Part 60-4.2);
7. Certification of Non-Segregated Facilities (41 CFR Part 60-1.8);
8. Debarment, Suspension, Ineligibility and Voluntary Exclusion (49 CFR Part 29).
9. Drug-Free Workplace Act of 1988 (41 USC 702-706).

NON-DISCRIMINATION CLAUSE: The Special Provisions (SPIG61) of the North Carolina Department of Transportation, apply to this contract. It is the policy of the Town of Elizabethtown 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/offerors, including those who qualify as DBE. A DBE contract goal of **4.0%** percent has been established for this contract. The bidder/offeror shall make good faith efforts, as defined in SPIG61 to meet the contract goal by utilizing DBE's in the performance of this contract.

The apparent successful bidder will be required to submit in the "Proposal" section of his bid the information concerning the DBE(s) that will participate in this contract. This information will include: (1) the names, addresses and telephone numbers of DBE firms that will participate in the contract, and the certifying agency documentation of current status as a bona fide DBE; (2) a description of the work that each DBE firm will perform; (3) the dollar amount of the participation of each DBE firm participating (4) written documentation of the bidder/offeror's commitment to use a DBE subcontractor whose participation it submits to meet the contract goal; and (5) written confirmation from the DBE that is participating in the contract as provided in the commitment made under (4).

If the bidder fails to achieve the contract goal stated herein, he will be required to provide documentation demonstrating that he made a good faith effort. The bidder's documentation shall be submitted in accordance with the provisions of SPIG61.

The Owner reserves the right to reject any or all bids and to waive informalities and minor irregularities.

Town of Elizabethtown
Dane Rideout, Town Manager
805 West Broad Street
Elizabethtown, NC 28337

End of Advertisement for Bids

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INSTRUCTIONS TO BIDDERS

The terms “Proposal” or “Bid” shall refer to the written offer of the bidder (or “proposer”) (when submitted on the approved bid/proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications. The terms “proposal” and “bid” may be used interchangeably throughout the contract documents. The bid, to be considered, must be submitted in accordance with the complete set of documents including the plans, and bidders are specifically directed to review the bid forms, these Instructions to Bidders, and the General Provisions.

1.1 GENERAL

A. BIDS

1. Bid forms have been included in this set of contract documents. These bid forms shall be included in the sealed envelope. A full set of contract documents is not required to be submitted at the time of bid opening.
2. Requirements for the preparation and submittal of a bid are included throughout these contract documents. Prospective bidders shall familiarize themselves with the complete set of documents including the plans, and are specifically directed to the bid forms, these Instructions to Bidders, and to Sections 20 and 30 of the General Provisions.
3. In the preparation of a bid, all blank spaces for bid items and bid alternatives must be properly filled in (written in ink or typed). Unit Prices shall be stated both in words and numerals. Total prices for bid items shall also be stated both in words and numerals. Total amounts bid shall be stated both in words and numerals in the proper place in the bid form. The complete form shall be without alterations or erasures. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.
4. The bidder shall complete the bid form as follows:
   a. If the documents are executed by a sole proprietor, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.
   b. If the documents are executed by a partnership, that fact shall be evidenced by the word "Partner" appearing after the name of the partner executing them.
   c. If the documents are executed by a corporation, they shall be executed in the name of the corporation by either the President or the Vice President and attested by the Secretary or Assistant Secretary and the corporate seal shall be impressed on each copy of the documents.
   d. All signatures must be in ink and properly witnessed.
5. **The completed bid forms, with all required attachments, shall be submitted in a sealed envelope on or before 2:00 PM, April 2, 2025.** Bids shall be addressed and delivered to:

   Town of Elizabethtown
   Dane Rideout, Town Manager
   466 Airport Rd.
   Elizabethtown, NC 28337

6. Bids will be opened at the aforementioned address.
7. Bid packages shall be enclosed in a sealed envelope, as required by the General Provisions Section 20, PROPOSAL REQUIREMENTS AND CONDITIONS.

8. It is solely the responsibility of the bidder to deliver his bid package to the proper official at the appointed time and place prior to the announced time for the opening of bids. Late delivery of the bid package for any reason shall disqualify the bid. A bidder may withdraw a bid provided that the bidder's request for withdrawal is received by the owner in writing or by telegram before the time specified for the opening of bids.
9. Modifications to bids will be accepted only if such modifications are delivered in writing (including telegram) to the Owner prior to the time for the opening of bids. Should the bidder find discrepancies in or omissions from the drawings or documents, or should he be in doubt as to the meaning of anything in the documents, he shall at once notify the Engineer, in writing, who, when necessary, will send a written instruction to all bidders through the issuance of an addendum to the contract documents. Neither, the Owner, nor the Engineer nor their representatives will be responsible for any oral instruction or interpretation.

1.2 BID GUARANTY

A. See Section **20-10 BID GUARANTY/BID BOND, of the General Provisions**.

1.3 QUALIFICATIONS OF BIDDERS

A. By submission of a bid the bidder agrees to perform the work if awarded a contract, and to perform at least 25% of the work under the contract with his own organization and with his own employees. If during the progress of the work hereunder, The Contractor requests an adjustment of such percentage and the Engineer determines that it would be to the Owner's advantage, the percentage of the work required to be performed by the Contractor's organization may be adjusted provided prior written approval of such adjustment is obtained from the Engineer.

B. Each bidder must furnish with his bid a breakdown of the work showing which portions of the work he will perform with his own forces and the estimated cost of these items.

C. All bidders, including subcontractors must be properly licensed in the state and must indicate their current license number on the outside of the sealed envelope containing their bid. Additional requirements for bid submission are: Contractor's must have a current listing as pre-qualified with the NCDOT.

D. All bidders must be prequalified by the NCDOT as a “Bidder” prior to submitting a bid and all Contractors and Subcontractors must be prequalified as a “Bidder” or “Subcontractor” prior to performing any work on this project.

1.4 E-VERIFY

Effective September 4, 2013, House Bill 786/S.L. 2013-418, passed by the General Assembly of North Carolina, requires that business entities and employers with whom a public entity contracts provide proof of enrollment and participation in E-Verify, an internet based system operated by the U.S. Department of Homeland Security, which may be used to determine the eligibility of new hires to work in the United States. This legislation applies to all state agencies, cities, counties, school boards,

as well as all private employers doing business in North Carolina who employ 25 or more employees in the State of North Carolina. This also applies to all city and county contracts, including all formal purchase and construction and repair contracts let by any public entity, as well as those not subject to competitive bidding requirements, such as service contracts. For other units of local government, such as local school boards and water/sewer authorities, the prohibition only applies to purchase and construction/repair contracts in the formal bidding range.

HB786 imposes E-Verify requirements on contractors who enter into certain contracts with state agencies and local governments. The legislation specifically prohibits governmental units from entering into certain contracts "unless the contractor and the contractor's subcontractors comply with the requirements of Article 2 of Chapter 64 of the General Statutes." (Article 2 of Chapter 64 establishes North Carolina's E-Verify requirements for private employers). It is important to note that the verification requirement applies to subcontractors as well as contractors.

The new laws specifically prohibit governmental units from entering into contracts with contractors who have not (or their subs have not) complied with E-Verify requirements. Although the new statutes don't specify the consequences for entering into a contract in violation of this prohibition, it may be reasonable to assume that the contract would be void.

As proof of enrollment and participation in E-Verify, Public Entities in North Carolina require the following:

1. See E-Verify Affidavit of Agreement for North Carolina

Any violation of this provision by the Contractor, would provide grounds for a breach of contract claim by the local government. Should the contractor fail to ensure that his or her subcontractors, if any, or subsequently hired subcontractors are non-compliant, would allow for the contract to be voided by the local government.

The following websites provide further information about participation and enrollment in E-Verify: www.uscis.gov/everfy.

1.5 EXAMINATION OF CONTRACT DOCUMENTATION AND SITE

A. Before submitting a bid, each bidder must:
   1. Examine the bidding documents thoroughly;
   2. Visit the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the work;
   3. Familiarize himself of federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the work;
   4. Study and carefully correlate bidder's observations with the Drawings and Specifications; and
   5. Notify the Engineer in writing of any conflicts, errors or discrepancies.

B. Before submitting a bid, the bidder may, at his own expense and assuming all risks, make any additional investigations and/or tests as the bidder may deem necessary for him to prepare his bid for performance of the work in accordance with the time, price and other terms and conditions of

the Contract Documents. On request in advance, the Owner will provide each bidder access to the site to conduct such explorations and tests as each bidder deems necessary for submission of a bid. The bidder shall upon completion of such explorations fill and compact as necessary all holes, and clean and restore the site to its former condition.

C. The Submission of a bid will constitute an incontrovertible representation by the bidder that he has complied with every requirement to bid the project and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the work.

1.6 ADDENDA

A. All questions concerning the meaning or intent of the Contract Documents are to be directed to the Engineer. During the bidding process, such inquiries must be made in writing. Interpretations or clarifications considered necessary by the Engineer in response to such questions will be made through the issuance of addenda to the Contract Documents. Any addenda to the Contract Documents issued during the time of bidding will be considered a part of the Contract Documents and will become a part of the Contract. Receipt of addenda shall be acknowledged by the bidder on the bid form.

1.7 INTERPRETATION OF ESTIMATED PROPOSAL QUANTITIES

A. See Section 20-05 **INTERPRETATION OF ESTIMATED PROPOSAL QUANTITIES, of the General Provisions**.

1.8 AWARD OF CONTRACT

A. The Award of the Contract will be made to the lowest responsive and responsible bidder as soon as practicable. The Owner reserves the right to reject any or all bids and to waive informalities and minor irregularities. The Owner may require the apparent low bidder to qualify himself to be a responsible bidder by furnishing financial statements, experience in completion of similar projects, the names of holders of trade licenses and similar information.

B. The NC Department of Transportation has agreed to reimburse the Owner for portions of the project costs. The Owner will not accept or consider proposals from which any Contractor whose name, at the time of opening of bids or award, appears on the current list of ineligible contractors published by the Comptroller General of the United States under Section 5.6 (b) of the Regulations of the Secretary of Labor (29 CFR Part 5), NC Department of Transportation list of ineligible contractors nor a proposal from any firm, corporation, partnership or proprietorship in which an ineligible Contractor has a substantial interest.

C. All contractors and subcontractors must be pre-qualified with NCDOT to perform work on the project.

1.9 CANCELLATION OF AWARD

A. The Owner reserves the right to cancel the award without liability to the bidder, except return of the bid guaranty, at any time before a contract has been fully executed by all parties and approved by the Owner.

1.10 PERFORMANCE AND LABOR AND MATERIALS PAYMENT BONDS

A. The Contractor shall furnish Performance, Labor, and Materials Payment surety bonds in the form indicated in the Contract Documents executed by a surety company authorized to do business in the state. Each such bond shall be in an amount equal to one hundred percent (100%) of the Contract price. Separate surety bonds shall be provided for the faithful performance of the Contract, for the payment of all persons performing labor on the project, and for furnishing materials in connection therewith.

1.11 BIDS TO BE RETAINED

A. No bid shall be withdrawn within **120** days after the scheduled time for the receipt of bids pending the execution of a Contract between the Owner and the successful bidder. Should the successful bidder default and not execute a contract, the Contract may be offered to the next lowest bidder. In this event the low bidder's bid guaranty will be kept by the Owner as liquidated damages.

END OF SECTION

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CONTRACTOR CONTRACTUAL REQUIREMENTS
AND
TITLE VI ASSURANCES

CIVIL RIGHTS ACT OF 1964, TITLE VI - CONTRACTOR CONTRACTUAL 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 shall 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, shall 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 shall not participate either directly or indirectly in the discrimination prohibited by 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 shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. **Information and Reports.** The contractor shall provide all information and reports required by the Acts, the Regulations and directives issued pursuant thereto and shall 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 (FAA) 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 this information, the contractor shall so certify to the sponsor or the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance.** In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the sponsor shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

   a. Withholding of payments to the contractor under the contract until the contractor complies, and/or

   b. Cancellation, termination, or suspension of the contract, in whole or in part.

6. **Incorporation of Provisions.** The contractor shall include the provisions of paragraphs 1 through 6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the sponsor or the FAA 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 supplier as a result of such direction, the contractor may request (the Sponsor) to enter into such litigation to protect the interests of the sponsor and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, SECTION 520 - GENERAL CIVIL RIGHTS PROVISIONS

The contractor assures that it will comply with pertinent statutes, Executive orders and such rules as are promulgated to assure 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.

DISADVANTAGED BUSINESS ENTERPRISES

1. **Contract Assurance.** The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of NCDOT SPIG61 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 recipient deems appropriate.

2. **Prompt Payment.** The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than seven days from the receipt of each payment the prime contractor receives from the recipient. The prime contractor agrees further to return retainage payments to each subcontractor within 7 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the recipient. This clause applies to both DBE and non-DBE subcontractors.

CERTIFICATION REGARDING LOBBYING

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.

ACCESS TO RECORDS AND REPORTS

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

BREACH OF CONTRACT TERMS

For all contracts that exceed the simplified acquisition threshold, presently set at $150,000.

Any violation or breach of terms of this contract on the part of the contractor or their 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 shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

RIGHTS TO INVENTIONS

All rights to inventions and materials generated under this contract are subject to regulations issued by the FAA and the Sponsor of the Federal grant under which this contract is executed.

TRADE RESTRICTION CLAUSE

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

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 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.

TERMINATION OF CONTRACT

1. The Sponsor may, by written notice, terminate this contract in whole or in part at any time, either for the Sponsor's convenience or because of failure to fulfill the contract obligations. Upon receipt of such notice services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this contract, whether completed or in progress, delivered to the Sponsor.

2. If the termination is for the convenience of the Sponsor, an equitable adjustment in the contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.

3. If the termination is due to failure to fulfill the contractor's obligations, the Sponsor may take over the work and prosecute the same to completion by contract or otherwise. In such case, the contractor shall be liable to the Sponsor for any additional cost occasioned to the Sponsor thereby.

4. If, after notice of termination for failure to fulfill contract obligations, it is determined that the contractor had not so failed, the termination shall be deemed to have been effected for the convenience of the Sponsor. In such event, adjustment in the contract price shall be made as provided in paragraph 2 of this clause.

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

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

For all contracts that exceed $25,000, and funded under the AIP, the bidder/offeror 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. It further agrees by submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

ENERGY CONSERVATION REQUIREMENTS

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42USC 6201 et seq).

VETERAN'S PREFERENCE

In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Veterans of the Vietnam, Persian Gulf and Afghanistan-Iraq war era and small business concerns owned and controlled by disabled veterans as defined in Title 49 United States Code, Section 47112. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

DAVIS BACON REQUIREMENTS

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; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

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

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

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

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

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor

has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

General Decision Number: NC20250063 01/03/2025

Superseded General Decision Number: NC20240063

State: North Carolina

Construction Type: Building

Counties: Bladen, Cleveland, Columbus, Harnett, Richmond, Robeson, Scotland and Wilson Counties in North Carolina.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts,
including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at

http://www.dol.gov/whd/govcontracts.

Modification Number Publication Date
0 01/03/2025

PLUM0421-004 07/01/2022

	Rates	Fringes
PIPEFITTER (Excluding HVAC System Installation)	$31.66	$12.69

SUNC2023-002 08/26/2011		
	Rates	Fringes
BRICKLAYER	$19.09	$8.73
CARPENTER (Drywall Hanging Only)	$18.13	$1.31
CARPENTER, Excludes Drywall Hanging, and Form Work	$ 15.93 **	$2.99
CEMENT MASON/CONCRETE FINISHER	$ 14.02 **	$0.00
ELECTRICIAN	$ 17.36 **	$3.07
FORM WORKER	$ 16.08 **	$3.48
GLAZIER	$18.16	$0.87
HVAC MECHANIC (Installation of HVAC Unit Only, Excludes Installation of HVAC Pipe and Duct)	$ 15.41 **	$2.60
IRONWORKER, STRUCTURAL	$18.75	$5.62
LABORER: Common or General	$ 10.53 **	$1.39
LABORER: Landscape & Irrigation	$ 10.29 **	$1.82
LABORER: Mason Tender-Brick/Cement/Concrete	$ 11.31 **	$0.00

OPERATOR: Backhoe/Excavator/Trackhoe	$17.98	$0.91
OPERATOR: Crane	$19.25	$2.37
OPERATOR: Grader/Blade	$ 15.71 **	$1.49
PAINTER: Brush, Roller and Spray	$ 14.60 **	$1.97
PLUMBER, Excludes HVAC Unit Installation	$ 17.42 **	$2.29
ROOFER	$ 13.55 **	$0.80
SHEET METAL WORKER (HVAC Duct Installation Only)	$ 15.29 **	$0.00
SHEET METAL WORKER, Excludes HVAC Duct and Unit Installation	$ 13.09 **	$1.28
TRUCK DRIVER: Dump Truck	$ 13.14 **	$1.01
WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.		

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.75) or 13658 ($13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including
their agencies, are a party.

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 https://www.dol.gov/agencies/whd/government-contracts.

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 classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", "SA", or "SC" denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, 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) an initial 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 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

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 David-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.

(A)(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) The contractor shall submit weekly for each week in which any contract work is performed a copy of all 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 https://www.dol.gov/agencies/whd/government-contracts/construction/payroll-certification or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under paragraph (3)(i) above and that such information is correct and complete;

(2) That each laborer and mechanic (including each helper, apprentice and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;

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

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

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

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

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less

than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance With Copeland Act Requirements.

The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

6. Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. Contract Termination: Debarment.

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of Eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

EQUAL EMPLOYMENT OPPORTUNITY - 41 CFR PART 60-1.4(b)

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, 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 s/he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, 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 procedure 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 provision, 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.

CERTIFICATION OF NONSEGREGATED FACILITIES - 41 CFR PART 60-1.8

Notice to Prospective Federally Assisted Construction Contractors

1. A Certification of Non-segregated Facilities shall be submitted prior to the award of a federally-

assisted construction contract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity Clause.

2. Contractors receiving federally-assisted construction contract awards exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the following notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Notice to Prospective Subcontractors of Requirements for Certification of Non-Segregated Facilities

1. A Certification of Non-segregated Facilities shall be submitted prior to the award of a subcontract exceeding $10,000, which is not exempt from the provisions of the Equal Opportunity Clause.

2. Contractors receiving subcontract awards exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

PROHIBITION OF SEGREGATED FACILITIES

The federally-assisted construction contractor certifies that she or he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that she or he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that she or he will not maintain or provide, for his employees, segregated facilities at any of his establishments and that she or he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term “segregated facilities” means any waiting rooms, work areas, restrooms, and washrooms, 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 which are segregated by explicit directives or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally-assisted construction contractor agrees that (except where she or he has obtained identical certifications from proposed subcontractors for specific time periods) she or he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that she or he will retain such certifications in his files.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS - 41 CFR Part 60.4.3

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 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 18.7a

through 18.7p 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 a superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through

appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all 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 (18.7a through 18.7p). 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 18.7a through 18.7p 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 18.7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION - 41 CFR PART 60-2

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.

The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Timetables

Goals for minority participation in each trade	Goals for female participation in each trade
33.5%	**6.9%**

These goals are applicable to all 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 shall 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.

2. The contractor shall provide written notification to the Director, 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 subcontract; and the geographical area in which the subcontract is to be performed.

3. As used in this notice and in the contract resulting from this solicitation, the "covered area" is **Bladen County,** North Carolina**.**

CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS 29 CFR PART 5

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) above, the contractor and any subcontractor responsible therefore 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 above, 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 above.

3. Withholding for Unpaid Wages and Liquidated Damages.
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 any monies 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 above.

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 section.

CLEAN AIR AND WATER POLLUTION CONTROL

Contractors and subcontractors agree:

a. That any facility to be used in the performance of the contract or subcontract or to benefit from the contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities;

b. To comply with all the requirements of Section 114 of the Clean Air Act, as amended, 42 U.S.C. 1857 et seq. and Section 308 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in Section 114 and Section 308 of the Acts, respectively, and all other regulations and guidelines issued thereunder;

c. That, as a condition for the award of this contract, the contractor or subcontractor will notify the awarding official of the receipt of any communication from the EPA indicating that a facility to be used for the performance of or benefit from the contract is under consideration to be listed on the EPA List of Violating Facilities;

d. To include or cause to be included in any construction contract or subcontract which exceeds $150,000 the aforementioned criteria and requirements.

OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970
(Reference 20 CFR part 1910)

All contracts and subcontracts that result from this solicitation incorporate the following provisions by reference, with the same force and effect as if given in full text. The contractor has full responsibility to monitor compliance to the referenced statute or regulation. The contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

Requirement	**Federal Agency with Enforcement Responsibilities**
Occupational Safety and Health Act of 1970 (20	U.S. Department of Labor – Occupational Safety

Requirement	Federal Agency with Enforcement Responsibilities
CFR Part 1910)	and Health Administration

TEXTING WHEN DRIVING

(References: Executive Order 13513, and 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), FAA encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or sub-grant.

COPELAND “ANTI-KICKBACK” ACT

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.

FEDERAL FAIR LABOR STANDARDS ACT (MINIMUM WAGE)

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.

PROCUREMENT OF RECOVERED MATERIALS

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:

1. The contract requires procurement of $10,000 or more of a designated item during the fiscal year; or
2. 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.

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DISADVANTAGED BUSINESS ENTERPRISE:

(10-16-07)**(Rev. 1-16-24)** 102-15(J) SP1 G61

Description

The purpose of this Special Provision is to carry out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with Federal funds. This provision is guided by 49 CFR Part 26.

Definitions

Additional DBE Subcontractors - Any DBE submitted at the time of bid that will not be used to meet the DBE goal. No submittal of a Letter of Intent is required.

Committed DBE Subcontractor - Any DBE submitted at the time of bid that is being used to meet the DBE goal by submission of a Letter of Intent. Or any DBE used as a replacement for a previously committed DBE firm.

Contract Goal Requirement - The approved DBE participation at time of award, but not greater than the advertised contract goal.

DBE Goal - A portion of the total contract, expressed as a percentage, that is to be performed by committed DBE subcontractor(s).

Disadvantaged Business Enterprise (DBE) - A firm certified as a Disadvantaged Business Enterprise through the North Carolina Unified Certification Program.

Goal Confirmation Letter - Written documentation from the Department to the bidder confirming the Contractor's approved, committed DBE participation along with a listing of the committed DBE firms.

Manufacturer - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

Regular Dealer - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular dealer engages in, as its principal business and in its own name, the purchase and sale or lease of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Replacement / Substitution – A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) DBE firm.

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for DBE certification, such that an applicant is required to apply only once for

a DBE certification that will be honored by all recipients of USDOT funds in the state and not limited to the Department of Transportation only. The Certification Program is in accordance with 49 CFR Part 26.

United States Department of Transportation (USDOT) - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

Forms and Websites Referenced in this Provision

DBE Payment Tracking System - On-line system in which the Contractor enters the payments made to DBE subcontractors who have performed work on the project. https://apps.dot.state.nc.us/Vendor/PaymentTracking/

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all DBE firms working on the project. This form is for paper bid projects only. https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf

RF-1 *DBE Replacement Request Form* - Form for replacing a committed DBE. https://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Form%20and%20Instructions.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. https://connect.ncdot.gov/projects/construction/Construction%20Forms/SAF%20Form%20-%20Subcontract%20Approval%20Form%20Revised%2004-19.xlsm

JC-1 *Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.pdf

Letter of Intent - Form signed by the Contractor and the DBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed DBE for the estimated amount (based on quantities and unit prices) listed at the time of bid. http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.pdf

Listing of DBE Subcontractors Form - Form for entering DBE subcontractors on a project that will meet this DBE goal. This form is for paper bids only. http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/08%20DBE%20Subcontractors%20(Federal).docx

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where DBEs quoted on the project. This sheet is submitted with good faith effort packages. http://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

DBE Goal

The following DBE goal for participation by Disadvantaged Business Enterprises is established for this contract:

Disadvantaged Business Enterprises **4.0 %**

(A) *If the DBE goal is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that DBEs participate in at least the percent of the contract as set forth above as the DBE goal.

(B) *If the DBE goal is zero*, the Contractor shall make an effort to recruit and use DBEs during the performance of the contract. Any DBE participation obtained shall be reported to the Department.

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the Directory as DBE certified shall be used to meet the DBE goal. The Directory can be found at the following link. https:// www.ebs.nc.gov/VendorDirectory/default.html

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

Listing of DBE Subcontractors

At the time of bid, bidders shall submit <u>all</u> DBE participation that they anticipate to use during the life of the contract. Only those identified to meet the DBE goal will be considered committed, even though the listing shall include both committed DBE subcontractors and additional DBE subcontractors. Additional DBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goal. Only those firms with current DBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of DBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of DBE participation in the appropriate section of the electronic submittal file.

(1) Submit the names and addresses of DBE firms identified to participate in the contract. If the bidder uses the updated listing of DBE firms shown in the electronic submittal file, the bidder may use the dropdown menu to access the name and address of the DBE firm.

(2) Submit the contract line numbers of work to be performed by each DBE firm. When no figures or firms are entered, the bidder will be considered to have no DBE participation.

(3) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.

(B) Paper Bids

(1) *If the DBE goal is more than zero,*

(a) Bidders, at the time the bid proposal is submitted, shall submit a listing of *DBE* participation, including the names and addresses on *Listing of DBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the DBE participation for the contract.

(b) If bidders have no DBE participation, they shall indicate this on the *Listing of DBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety. **Blank forms will not be deemed to represent zero participation**. Bids submitted that do not have DBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.

(c) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the corresponding goal.

(2) *If the DBE goal is zero,* entries on the *Listing of DBE Subcontractors* are not required for the zero goal, however any DBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

DBE Prime Contractor

When a certified DBE firm bids on a contract that contains a DBE goal, the DBE firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other bidder. In most cases, a DBE bidder on a contract will meet the DBE goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the DBE bidder and any other DBE subcontractors will count toward the DBE goal. The DBE bidder shall list itself along with any DBE subcontractors, if any, in order to receive credit toward the DBE goal.

For example, if the DBE goal is 45% and the DBE bidder will only perform 40% of the contract work, the prime will list itself at 40%, and the additional 5% shall be obtained through additional DBE participation with DBE subcontractors or documented through a good faith effort.

DBE prime contractors shall also follow Sections A and B listed under *Listing of DBE Subcontractor* just as a non-DBE bidder would.

Written Documentation – Letter of Intent

The bidder shall submit written documentation for each DBE that will be used to meet the DBE goal of the contract, indicating the bidder's commitment to use the DBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent*.

The documentation shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. of the sixth calendar day following opening of bids, unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed DBE to be used toward the DBE goal, or if the form is incomplete (i.e. both signatures are not present), the DBE participation will not count toward meeting the DBE goal. If the lack of this participation drops the commitment below the DBE goal, the Contractor shall submit evidence of good faith efforts, completed in its entirety, to the State Contractor Utilization Engineer or DBE@ncdot.gov no later than 10:00 a.m. on the eighth calendar day following opening of bids, unless the eighth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

Submission of Good Faith Effort

If the bidder fails to meet or exceed the DBE goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

A hard copy and an electronic copy of this information shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. on the sixth calendar day following opening of bids unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day. If the contractor cannot send the information electronically, then one complete set and 5 copies of this information shall be received under the same time constraints above.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

Consideration of Good Faith Effort for Projects with DBE Goals More Than Zero

Adequate good faith efforts mean that the bidder took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient DBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought DBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a bidder has made. Listed below are examples of the types of actions a bidder will take in making a good faith effort to meet the goal and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

(A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising, written notices, use of verifiable electronic means through the use of the NCDOT Directory of Transportation Firms) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within at least 10 days prior to bid opening to allow the DBEs to respond to the solicitation. Solicitation shall provide the opportunity to DBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

(B) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved.

(1) Where appropriate, break out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

(2) Negotiate with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be sublet includes potential for DBE participation (2nd and 3rd tier subcontractors).

(C) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(D) (1) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

(2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(E) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(F) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.

(G) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs. Contact within 7 days from the bid opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the bidder's inability to get DBE quotes.

(I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the DBE goal.

In addition, the Department may take into account the following:

(1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the DBE goal.

(2) The bidders' past performance in meeting the DBE goals.

(3) The performance of other bidders in meeting the DBE goal. For example, when the apparent successful bidder fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to the Department that the DBE goal can be met or that an adequate good faith effort has been made to meet the DBE goal.

Non-Good Faith Appeal

The State Prequalification Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the State Prequalification Engineer or at DBE@ncdot.gov. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

Counting DBE Participation Toward Meeting DBE Goal

(A) Participation

The total dollar value of the participation by a committed DBE will be counted toward the contract goal requirement. The total dollar value of participation by a committed DBE will be based upon the value of work actually performed by the DBE and the actual payments to DBE firms by the Contractor.

(B) Joint Checks

Prior notification of joint check use shall be required when counting DBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 *(Joint Check Notification Form)* and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

(C) Subcontracts (Non-Trucking)

A DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract goal requirement. Work that a DBE subcontracts to a non-DBE firm does not count toward the contract goal requirement. If a DBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the DBE is not performing a commercially useful function. The DBE may present evidence to rebut this presumption to the Department. The Department's decision on the rebuttal of this presumption is subject to review by the Federal Highway Administration but is not administratively appealable to USDOT.

(D) Joint Venture

When a DBE performs as a participant in a joint venture, the Contractor may count toward its contract goal requirement a portion of the total value of participation with the DBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the DBE performs with its forces.

(E) Suppliers

A contractor may count toward its DBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a DBE regular dealer and 100 percent of such expenditures from a DBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor may count toward its DBE requirement the following expenditures to DBE firms that are not manufacturers or regular dealers:

(1) The fees or commissions charged by a DBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

(2) With respect to materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Commercially Useful Function

(A) DBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to DBEs that perform a commercially useful function in the work of a contract. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and any other relevant factors.

(B) DBE Utilization in Trucking

The following factors will be used to determine if a DBE trucking firm is performing a commercially useful function:

(1) The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting DBE goals.

(2) The DBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The DBE may subcontract the work to another DBE firm, including an owner-operator who is certified as a DBE. The DBE who subcontracts work to another DBE receives credit for the total value of the transportation services the subcontracted DBE provides on the contract.

(5) The DBE may also subcontract the work to a non-DBE firm, including from an owner-operator. The DBE who subcontracts the work to a non-DBE is entitled to credit for the total value of transportation services provided by the non-DBE subcontractor not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the DBE and the Contractor will not count towards the DBE contract requirement.

(6) A DBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the DBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. This type of lease may count toward the DBE's credit as long as the driver is under the DBE's payroll.

(7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the DBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

DBE Replacement

When a Contractor has relied on a commitment to a DBE subcontractor (or an approved substitute DBE subcontractor) to meet all or part of a contract goal requirement, the contractor shall not terminate the DBE subcontractor for convenience. This includes, but is not limited to, instances in which the Contractor

seeks to perform the work of the terminated subcontractor with another DBE subcontractor, a non-DBE subcontractor, or with the Contractor's own forces or those of an affiliate.

The Contractor must give notice in writing both by certified mail and email to the DBE subcontractor, with a copy to the Engineer of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor must give the DBE subcontractor five (5) business days to respond to the Contractor's Notice of Intent to Request Termination and/or Substitution. If the DBE subcontractor objects to the intended termination/substitution, the DBE, within five (5) business days must advise the Contractor and the Department of the reasons why the action should not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the DBE subcontractor.

A committed DBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and/or substitution. For purposes of this section, good cause shall include the following circumstances:

(a) The listed DBE subcontractor fails or refuses to execute a written contract;
(b) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
(c) The listed DBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
(d) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
(e) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
(f) The listed DBE subcontractor is not a responsible contractor;
(g) The listed DBE voluntarily withdraws from the project and provides written notice of withdrawal;
(h) The listed DBE is ineligible to receive DBE credit for the type of work required;
(i) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;
(j) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE contractor was engaged or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award.

The Contractor shall comply with the following for replacement of a committed DBE:

(A) Performance Related Replacement

When a committed DBE is terminated for good cause as stated above, an additional DBE that was submitted at the time of bid may be used to fulfill the DBE commitment. A good faith effort will only be required for removing a committed DBE if there were no additional DBEs submitted at the time of bid to cover the same amount of work as the DBE that was terminated.

If a replacement DBE is not found that can perform at least the same amount of work as the terminated DBE, the Contractor shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

(1) Copies of written notification to DBEs that their interest is solicited in contracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.

(2) Efforts to negotiate with DBEs for specific subbids including, at a minimum:

(a) The names, addresses, and telephone numbers of DBEs who were contacted.
(b) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed.

(3) A list of reasons why DBE quotes were not accepted.

(4) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

(1) When a committed DBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Contractor to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.

(2) When a committed DBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named DBE firm, the Contractor shall take all necessary and reasonable steps to replace the DBE subcontractor with another DBE subcontractor to perform at least the same amount of work to meet the DBE goal requirement. If a DBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

(3) Exception: If the DBE's ineligibility is caused solely by its having exceeded the size standard during the performance of the contract, the Department will not require the Contractor to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement and overall goal.

All requests for replacement of a committed DBE firm shall be submitted to the Engineer for approval on Form RF-1 *(DBE Replacement Request)*. If the Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 months.

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Contractor will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a DBE based upon the Contractor's commitment, the DBE shall participate in additional work to the same extent as the DBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Contractor shall seek additional participation by DBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed DBE, the Contractor shall seek participation by DBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a DBE, the Contractor shall seek additional participation by DBEs equal to the reduced DBE participation caused by the changes.

Reports and Documentation

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a DBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving DBE subcontractors.

When using transportation services to meet the contract commitment, the Contractor shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a DBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for DBE credit.

Reporting Disadvantaged Business Enterprise Participation

The Contractor shall provide the Engineer with an accounting of payments made to all DBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

(A) Withholding of money due in the next partial pay estimate; or

(B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to DBEs, it shall be the prime contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for work on future DOT projects until the required information is submitted.

Contractors reporting transportation services provided by non-DBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.

The Contractor shall report the accounting of payments through the Department's DBE Payment Tracking System.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *Standard Specifications* may be cause to disqualify the Contractor.

BID FORMS

Date: _____

TO: **Town of Elizabethtown**
Dane Rideout, Town Manager
805 W. Broad Street
Elizabethtown, NC 28337

The undersigned, as bidder, hereby declares that the only person or persons interested in this bid as principal or principals is or are named herein and that no person other than those herein mentioned, has any interest in the bid or in the contract to be entered into; that this bid is made without connection with any other person, company or parties making a bid; and that it is in all respects fair and in good faith without collusion or fraud.

The bidder further declares that he has examined the site of the work and informed himself fully in regard to all conditions pertaining to the place where the work is to be done, that he has examined the specifications for the work and contract documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work performed. In case of conflict between words and figures, the words will govern.

The bidder proposes and agrees that if this bid is accepted, to contract with the Town of Elizabethtown in the form of contract specified, to furnish all necessary transportation and labor necessary to perform all construction in full and complete agreement with the plans and specifications and contract documents to the full and entire satisfaction of Town of Elizabethtown as computed from the schedule of unit prices hereinafter shown. The quantities of work shown by unit prices are approximations only and the contract price will be based on the actual quantities included in the work.

The bidder agrees not to withdraw his bid within **120** days after the scheduled closing time for receipt of bids.

A bidder shall be considered disqualified for any of the following reasons, among others:

(a) Submitting more than one bid 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.

The Owner reserves that right to reject any or all bids or sections thereof or to accept such bids or sections thereof, as it appears in its judgment to be in the best interest of the Owner.

Bidders are hereby notified that all bids may be rejected if the lowest responsible bid(s) received exceeds the Engineer's estimate by more than 7% and it is determined that an award of the contract would cause excessive inflationary impact. Nothing in this paragraph shall limit in any manner the Owner's right to reject any and all bids if it appears in its judgment to be its best interest to do so. The bidder agrees, if awarded the contract to commence work on the commencement date stated in the Notice to Proceed or within ten (10) days after

such specified commencement date. The bidder further agrees that in the case or failure on his part to execute said contract and the bonds required within ten (10) consecutive calendar days after written notice is given of the award of the contract, the bid bond accompanying this bid shall be paid into the hands of the Owner, as liquidated damages for such failure; otherwise, the bid bond accompanying this bid shall be returned to the undersigned.

Bidders are hereby notified that all bids may be rejected if the lowest responsible bid(s) received exceeds the Engineer's estimate by more than 7% and it is determined that an award of the contract would cause excessive inflationary impact. Nothing in this paragraph shall limit in any manner the Owner's right to reject any and all bids if it appears in its judgment to be its best interest to do so.

Respectfully submitted,

Signature of Bidder:

a. If an Individual doing business as: _____

b. If a Partnership: _____
(Member of Firm)

c. If a Corporation: _____
(Name of Corporation)

_____
(Officer)

_____
(Title)

ATTEST: _____ Date: _____
(Witness)

Current Contractor's North Carolina Registration Number: _____

Business Address: _____

_____

ADDENDA ACKNOWLEDGE

Receipt of the following Addenda is hereby acknowledged:

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____
_____	_____

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 1

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
BID SCHEDULE 1: 160'x60' HANGAR					
1 C-105-1	Mobilization (10% max.) @ (write in words)	1	LS		
2 C-100-1	Contractor Quality Control Program (CQCP) @ (write in words)	1	LS		
3 C-102-1	Temporary Construction Entrance (Installation, Maintenance & Removal) @ (write in words)	1	EA		
4 C-102-2	Temporary Compost Filter Sock & Outlets (Installation, Maintenance, and Removal) @ (write in words)	800	LF		
5 C-102-3	Temporary Fiber Roll Check Dam (Installation, Maintenance, and Removal) @ (write in words)	1	EA		
6 C-102-4	Erosion Control Matting (Installation and Maintenance) @ (write in words)	520.0	SY		
7 C-102-5	Temporary Seeding (Including Seed, Lime, Fertilizer, and Mulch) @ (write in words)	2	AC		
8 C-102-6	NCDOT Class A Rip-Rap @ (write in words)	2	TONS		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 1

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
9 P-101-1	Asphalt Cold Milling (Varying Depth) @ (write in words)	100	SY		
10 P-101-2	Remove Existing Perimeter Fence, 6' High Chain-Link @ (write in words)	20	LF		
11 P-101-3	Remove Existing Riprap @ (write in words)	20	SY		
12 P-152-1	Unclassified Excavation @ (write in words)	140	CY		
13 P-152-2	Undercut Excavation, Replace with Backfill @ (write in words)	230	CY		
14 P-152-3	Embankment in Place @ (write in words)	800	CY		
15 P-209-1	Crushed Aggregate Base Course (6" Thickness) @ (write in words)	300	CY		
16 P-401-1	Asphalt Surface Course @ (write in words)	420.0	TON		
17 P-602-1	Emulsified Asphalt Prime Coat @ (write in words)	480	GAL		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 1

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
18 P-603-1	Emulsified Asphalt Tack Coat @ (write in words)	120	GAL		
19 P-620-1	Pavement Markings, Temporary, Yellow (No Beads) @ (write in words)	150	SF		
20 P-620-2	Pavement Markings, Permanent, Yellow, Reflective (Type III Beads), include Microbicide @ (write in words)	150	SF		
21 P-620-3	Pavement Markings, Permanent, Black, include microbicide @ (write in words)	100	SF		
22 T-901-1	Permanent Seeding, including Seed, Lime, Fertilizer, & Mulch @ (write in words)	2	AC		
23 T-905-1	Topsoil (Furnished from On Site) @ (write in words)	170	CY		
24 T-905-2	Topsoil (Furnished from Off Site) @ (write in words)	160	CY		
25 F-162-1	Vehicle Gate (Provide and Install) @ (write in words)	1	EA		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 1

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
26 VARIES	Hangar Building, Complete @ (write in words)	9,600	SF		
				TOTAL BID	

For a bid to be considered responsive, the bidder shall provide bid prices for all schedules of work.
Contract award will be based on the lowest responsive and responsible bidder.

Contract Time: 180 Calendar Days
Liquidated Damages: $1,000.00 per Calendar Day Overrun

Required DBE Goal: 4.0 %
DBE Percentage used by Bidder: _____ %

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 2

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
BID SCHEDULE 2: 80'x80' HANGAR					
1 C-105-1	Mobilization (10% max.) @ (write in words)	1	LS		
2 C-100-1	Contractor Quality Control Program (CQCP) @ (write in words)	1	LS		
3 C-102-1	Temporary Construction Entrance (Installation, Maintenance & Removal) @ (write in words)	1	EA		
4 C-102-2	Temporary Compost Filter Sock & Outlets (Installation, Maintenance, and Removal) @ (write in words)	800	LF		
5 C-102-3	Temporary Fiber Roll Check Dam (Installation, Maintenance, and Removal) @ (write in words)	1	EA		
6 C-102-4	Erosion Control Matting (Installation and Maintenance) @ (write in words)	320.0	SY		
7 C-102-5	Temporary Seeding (Including Seed, Lime, Fertilizer, and Mulch) @ (write in words)	1	AC		
8 C-102-6	NCDOT Class A Rip-Rap @ (write in words)	2	TONS		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 2

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
9 P-101-1	Asphalt Cold Milling (Varying Depth) @ (write in words)	100	SY		
10 P-101-2	Remove Existing Perimeter Fence, 6' High Chain-Link @ (write in words)	20	LF		
11 P-101-3	Remove Existing Riprap @ (write in words)	20	SY		
12 P-152-1	Unclassified Excavation @ (write in words)	50	CY		
13 P-152-2	Undercut Excavation, Replace with Backfill @ (write in words)	130	CY		
14 P-152-3	Embankment in Place @ (write in words)	600	CY		
15 P-209-1	Crushed Aggregate Base Course (6" Thickness) @ (write in words)	200	CY		
16 P-401-1	Asphalt Surface Course @ (write in words)	210.0	TON		
17 P-602-1	Emulsified Asphalt Prime Coat @ (write in words)	240	GAL		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 2

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
18 P-603-1	Emulsified Asphalt Tack Coat @ (write in words)	70	GAL		
19 P-620-1	Pavement Markings, Temporary, Yellow (No Beads) @ (write in words)	110	SF		
20 P-620-2	Pavement Markings, Permanent, Yellow, Reflective (Type III Beads), include Microbicide @ (write in words)	110	SF		
21 P-620-3	Pavement Markings, Permanent, Black, include microbicide @ (write in words)	100	SF		
22 T-901-1	Permanent Seeding, including Seed, Lime, Fertilizer, & Mulch @ (write in words)	1	AC		
23 T-905-1	Topsoil (Furnished from On Site) @ (write in words)	80	CY		
24 T-905-2	Topsoil (Furnished from Off Site) @ (write in words)	110	CY		
25 F-162-1	Vehicle Gate (Provide and Install) @ (write in words)	1	EA		

Curtis L. Brown, Jr. Field (EYF)
Multi-Unit Hangar Development, Phase 1
Schedule of Work
BID SCHEDULE 2

Item No. & Spec.	Description and Unit Price in Words	Quantity	Unit	Unit Price	Extended Total
26 VARIES	Hangar Building, Complete @ (write in words)	6,400	SF		
				TOTAL BID	

For a bid to be considered responsive, the bidder shall provide bid prices for all schedules of work.
Contract award will be based on the lowest responsive and responsible bidder.

Contract Time: 130 Calendar Days
Liquidated Damages: $1,000.00 per Calendar Day Overrun

Required DBE Goal: 4.0 %
DBE Percentage used by Bidder: _____ %

Bid Bond

Date of Bond: _____, 202_____

Name and address of Principal (Bidder) _____

Name and address of Surety: _____

Name and address of Obligee (Owner)

Town of Elizabethtown
Dane Rideout, Town Manager
805 West Broad Street
Elizabethtown, NC 28337

Amount of Bond: _____

Project Multi-Unit Hangar Development, Ph. 1

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal above named and the Surety above named, which is duly licensed under the laws of North Carolina to execute bid bonds, are held and firmly bound unto the Obligee above named in the penal sum of five percent (5%) of the amount bid in the bid above described in lawful money of the United States of America for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, assigns and successors, jointly and severally, firmly by these presents.

NOW THEREFORE, THE CONDITION OF THI S OBLIGATION is such, that if the Principal shall be awarded the contract for which the bid above described is submitted and shall execute the contract, give bond for the faithful performance of the contract, and give bond for the payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, within ten (10) days after the award of the same to the Principal, then this obligation shall be null and void; but if the Principal fails to so execute such contract and give the performance bond and the payment bond as required by Section 129 of Chapter 44A of the North Carolina General Statutes, as amended, the Surety shall, upon demand, forthwith pay to the Obligee the amount of this bond set forth above.

Regardless of any statement to the contrary, the terms and provisions of this bond shall not be altered, amended or limited by any attachment, rider or condition.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Principal (Name of individual, individual and trade Name, partnership, joint venture, or corporation)

WITNESS:

By: _____(SEAL)

Title: _____
(Owner, partner, joint venture, or Office held in corporation)

(If a proprietorship, partnership or joint venture)

ATTEST: (If a corporation)

By: _____

(Corporate Seal of Principal)

Title: _____
(Corporate Secretary or Assistant Secretary only)

Surety (Name of Surety)

WITNESS:

By: _____
Attorney in Fact

_____
(Type or Print Name of Attorney in Fact)

(Corporate Seal of Surety)

_____
_____
(Address of Attorney in Fact)

EQUAL EMPLOYMENT OPPORTUNITY (EEO) REPORT STATEMENT
(41 CFR Part 60-1.7)

The Bidder shall complete the following statement by checking the appropriate boxes. Failure to complete these blanks may be grounds for rejection of bid.

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:_____

DISADVANTAGED BUSINESS ENTERPRISE (DBE)

Policy. The requirements of NCDOT SPIG61, apply to this contract. It is the policy of the Town of Elizabethtown 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/offerors, including those who qualify as a DBE. A DBE contract goal of **4.0%** percent has been established for this contract. The bidder/offeror shall make good faith efforts, as defined in the Instruction to Bidders section of the specifications and Appendix A, SPIG61, to meet the contract goal by utilizing DBEs in the performance of this contract.

DBE Obligation. The contractor agrees to ensure that disadvantaged business enterprises as defined in NCDOT SPIG61 have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with federal funds provided under this agreement. In this regard, all contractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged business enterprises have the maximum opportunity to compete for and perform contracts. Contractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of this subsequent subcontracts.

DBE Participation. The Bidder shall provide the following information for disadvantaged subcontractors whom it proposes to engage in carrying out and completing the work called for by this proposal. No change shall be made in any of the disadvantaged subcontractors proposed to be engaged by the bidder, should it be the successful bidder, following the opening of this proposal without the prior written consent and approval of the Town of Elizabethtown.

Disadvantaged Business Enterprise Utilization. The undersigned has satisfied the requirements of the specifications in the following manner (please check the appropriate space):

TOTAL BID:

_____ The Bidder is committed to a minimum of **4.0%** DBE utilization on this project.

_____ The Bidder (if unable to meet the goal of ___ is committed to a minimum of ___ DBE utilization on this project and has submitted documentation showing good faith effort as listed in the section entitled "Contractor's Required Submission" in the Instruction to Bidders.

Contractor: _____

By: _____
Signature Title

Address: _____

Zip Code: _____ Phone Number: _____

Contract Number C _____
_____ County (ies)

LISTING OF DBE SUBCONTRACTORS				Sheet _____ of _____	
FIRM NAME AND ADDRESS	DBE	ITEM NO.	ITEM DESCRIPTION	* AGREED UPON UNIT PRICE	** DOLLAR VOLUME OF ITEM

* The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the DBE subcontractor, and these prices will be used to determine the percentage of the DBE participation in the contract.

** Dollar Volume of DBE Subcontractor $_____

Percentage of Total Contract Bid Price _____%

** Must have entry even if figure to be entered is zero.

This form must be completed in order for the Bid to be considered responsive and be publicly read.
Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

LETTER OF INTENT TO PERFORM AS A SUBCONTRACTOR

CONTRACT:	NAME OF BIDDER:

The undersigned intends to perform work in connection with the above contract upon execution of the bid and subsequent award of contract by the Board of Transportation as:

Name of MBE/WBE/DBE Subcontractor_____ Address

_____ City

_____State_____Zip

Please check all that apply: Minority Business Enterprise (MBE) _____

Women Business Enterprise (WBE) _____

Disadvantaged Business Enterprise (DBE) _____

The MBE /WBE /DBE status of the above named subcontractor is certified by the North Carolina Department of Transportation. The above named subcontractor is prepared to perform the described work listed on the attached MBE/WBE/DBE Commitment Items sheet, in connection with the above contract upon execution of the bid and subsequent award of contract by the Board of Transportation. The above named subcontractor is prepared to perform the described work at the estimated Commitment Total for Subcontractor Price identified on the MBE/WBE/DBE Commitment Items sheet and amount indicated below.

Commitment Total based on estimated Unit Prices and Quantities on the "attached" MBE/WBE/DBE Commitment Items sheet. Amount $

The above named bidder and subcontractor mutually accepts the Commitment Total estimated for the Unit Prices and Quantities. This commitment total is based on estimated quantities only and most likely will vary up or down as the project is completed. Final compensation will be based on actual quantities of work performed and accepted during the pursuance of work. The above listed amount represents the entire dollar amount quoted based on these estimated quantities. No conversations, verbal agreements, and/or other forms of non-written representations shall serve to add, delete, or modify the terms as stated.

This document shall not serve in any manner as an actual subcontract between the two parties. A separate subcontractor agreement will describe in detail the contractual obligations of the bidder and the MBE/WBE/DBE subcontractor.

Affirmation

The above named MBE/ WBE/ DBE subcontractor affirms that it will perform the portion(s) of the contract for the estimated dollar value as stated above.

Name of MBE/ WBE/ DBE Subcontractor	Name of Bidder
Signature / Title	Signature / Title
Date	Date

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

DIVISION OF AVIATION
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

AV-509/AV-510 DBE/MBE/WBE/HUB VENDOR COMMITMENTS/AWARDS/PAYMENTS

AIRPORT NAME: _____ **CONTRACTOR REQUEST #:** _____

WBS #: _____ **FINAL** ☐

Instructions: Select the Final button if this is the last payment for this project. If any percentages are not 100%, then also submit an AV-514.

The % column includes total payment, including the current payment to meet the goal.

Payor Name	SAP Payor Report ID	Vendor / Sub Name	SAP Vendor / Sub Report ID	Awards and Billings				Date Paid to Vendor / Sub this Invoice	%
				Committed Award ($) AV-509	Total Prior Payments ($) (AV-510)	Current Payment ($)	Total ($)		

PAYOR NAME: _____ **PAYOR SIGNATURE:** _____ **DATE SIGNED:** _____

SPONSOR NAME: _____ **SPONSOR SIGNATURE:** _____ **DATE SIGNED:** _____

Notes: (AV-509/AV-510) (10/19) Form must be complete in order to be processed. Incomplete forms will be returned which will delay reimbursement request.

For SAP Payor Report ID and SAP Vendor/Sub Report ID, please go to https://www.ebs.nc.gov/VendorDirectory/default.html to verify IDs.

CERTIFICATE OF PROMPT PAYMENT

The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than seven (7) days from the receipt of each payment the prime contractor received from the Owner. The prime contractor agrees further to return retainage payments to each subcontractor within seven (7) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above-referenced time frame may occur only for good cause following written approval of the Owner. This clause applies to both DBE and non-DBE subcontractors.

Name of Bidder:_____

By:_____

Title:_____

Date:_____

CERTIFICATION

The undersigned hereby certifies to the Town of Elizabethtown that:

TRADE RESTRICTION CERTIFICATION

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

a. is not owned or controlled by one or more citizens 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.

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 a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract at no cost to the Government.

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide written notice to the contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

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

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

BUY AMERICAN CERTIFICATION

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

A bidder or offeror must submit the appropriate Buy America certification (below) with all bids or offers on AIP funded projects. Bids or offers that are not accompanied by a completed Buy America certification must be rejected as nonresponsive.

Certificate of Buy American Compliance for Total Facility
(Buildings such as Terminal, SRE, ARFF, etc.)

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 of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter "X".

☐ Bidder 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 products
3. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

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

Required Documentation

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

a) Listing of all manufactured products that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety)
b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
c) Percentage of non-domestic component and subcomponent cost as compared to total "facility" component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

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

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

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

Date	Signature
Company Name	Title

CERTIFICATION OF NONSEGREGATED FACILITIES

The federally-assisted construction contractor certifies that she or he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that she or he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that she or he will not maintain or provide, for his employees, segregated facilities at any of his establishments and that she or he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directives or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally-assisted construction contractor agrees that (except where she or he has obtained identical certifications from proposed subcontractors for specific time periods) she or he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that she or he will retain such certifications in his files.

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

The bidder/offeror 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. It further agrees by submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

Name of Bidder: _____

By: _____

Title: _____

Date: _____

AFFIDAVIT OF NON-COLLUSION

STATE OF _____
COUNTY _____

Personally appeared before me _____ being duly sworn says that he is a member of the firm of _____ and further says that his firm, association, or cooperation has not, either directly or indirectly, entered any agreement, participated in any collusion, or otherwise taken any action in resistant of for competitive bidding in connection with the submission of a bid on the above-named project.

Further, _____ swears and affirms that all legal formalities required for the proper execution of affidavits pursuant to the laws of his state have been complied with an further agrees on behalf of himself, his firm association, or corporation, that in any subsequent prosecution of perjury of him, his firm association, or corporation, it shall note a defense to such charge perjury that said formalities were not in fact complied with.

_____
Typed Name and Title

_____
Legal Signature

SWORN to me before this _____ day of _____, 202__.

_____

Notary Public for _____

Bidders List

All firms bidding or quoting on subcontracts for this DOT-assisted project are listed below.

Firm Name	Address	Describe Type of Work Firm Performs	Certified NC DBE (Y or N)	Age of Firm

E-VERIFY AFFIDAVIT OF AGREEMENT FOR NORTH CAROLINA

STATE OF _____

COUNTY OF _____

Before me, the undersigned authority, personally appeared _____(Affiant) who, being by me first duly sworn, doth depose and say as follows:

I, in my capacity as _____ (Title) of _____ (Business Entity or Employer), having lawful authority to act in its behalf and personal knowledge of the facts set out herein, do attest to the following:

During the term or performance of any contract with Town of Elizabethtown, North Carolina

1. ☐ The Business Entity or Employer will not knowingly employ, hire for employment, or continue to employ any unauthorized alien. The Business Entity or Employer is enrolled in E-Verify. The Business Entity or Employer will participate in E-Verify to verify the employment status of new hires, as well as any subcontractors' compliance with E-Verify;

****** [**OR**] ******

2. ☐ The Business Entity has 25 or fewer employees and do not intend to hire 26 employees or more for the purpose of supplying goods or services. Per NC House Bill 786/S.L. 2013-418, vendors with 25 or fewer employees are exempt from acquiring an E-Verify account and are required to supply a copy of their driver license if they have not registered and do not have an E-Verify User Identification Number. Should the Business Entity or Employer acquire more than 26 employees, the Business Entity or Employer will acquire an E-Verify account.

_____ _____

Date Signature of Affiant

I, the undersigned Notary Public in and for _____ hereby certify that _____ whose name as _____(Title) of _____ (Business Entity or Employer) and first being duly sworn the foregoing Affidavit and who is known to me, acknowledged before me on this day that, being informed of the contents of the said Affidavit he/she, as such officer or agent and with full authority, executed the same voluntarily as and for the act of the Business Entity or Employer.

Given under my hand and seal this _____ day of _____, 202_____.

(affix seal)

_____

Notary Public

Print Name: _____

My Commission Expires: _____

(Attach to Bid)

IRAN DIVESTMENT ACT
(In Accordance with N.C.G.S. 143C-6A-1 to 6A-9 effective February 26, 2016)

The **vendor certification requirement** under the Iran Divestment Act was **eliminated, effective October 1, 2017!**

Governor Cooper signed legislation into law on Thursday, July 27, 2017, repealing the statute requiring that every State contract, and the contracts with any of its sub-units or with local government entities, include a contractor certification that the contractor is not on the list of entities doing business with Iran that is maintained by the Office of the State Treasurer. **The prohibition itself, however, remains in effect.**

In the future, the North Carolina Department of Administration Division of Purchase & Contract will post new solicitation templates with the certification requirement removed.

Note that the prohibition against contracting with vendors on the Treasurer's list remains in effect, even if a certification of that fact will no longer be needed. Each purchaser should download a copy of the list from the Treasurer's web site and check it before making any award recommendation, to make sure your selected vendor is not on the list, which would make your contract void. The Treasurer's list is updated every three months.

The list of prohibited vendors can be downloaded from:
https://www.nctreasurer.com/inside-the- department/OpenGovernment/Pages/Iran-Divestment-Act-Resources.aspx.

Remember to download both the *Final Divestment List* and the *Parent and Subsidiary List* from this page. Most of the companies on these lists are oil and petrochemical companies located in China or India.

CERTIFICATION OF OFFERER/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The Bidder must complete the following two certification statements. The Bidder 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 Bidder 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 Bidder 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 Bidder 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 Bidder responds in the affirmative to either of the above representations, the Bidder 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 Bidder therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify 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.

Name of Bidder: _____

By:_____

Title: _____

CONTRACT

THIS CONTRACT, made and entered into this _____ day of _____, 202__, by and between Town of Elizabethtown, North Carolina hereinafter called the Owner and _____ hereinafter called the Contractor.

WITNESSETH: That the Contractor, for the consideration hereinafter fully set out, and the Owner, for the construction of work performed, agree that:

1. Scope of Work: The Contractor shall furnish and deliver all the materials and perform all the work in the manner and form as provided in the following enumerated plans, specifications and contract documents which are attached hereto and made a part thereof as if fully contained herein: Multi-Unit Hangar Development, Phase 1.

SPECIFICATIONS AND CONTRACT DOCUMENTS:

(a) Notice to Bidders
(b) Instructions to Bidders
(c) Proposal (as Accepted)
(d) Performance Bond and Labor and Materials Payment Bond
(e) General Provisions
(f) Special Provisions
(g) Technical Specifications
[(h) Addendum No. 1 dated _____]
[(i) Addendum No. 2 dated _____]
(j) Drawings prepared by W.K. Dickson & Co., LLC, 720 Corporate Center Drive, Raleigh, NC 27607**,** dated March 2025.

Contract Amount $ _____
Contract Time: TBD Calendar Days
Liquidated Damages for Contract Time Overrun: $1,000.00 Per Calendar Day

2. The Contractor shall commence the work to be performed under this contract not later than the date set by the Engineer in written notice to proceed, said date to be not less than ten (10) days after issuance of notice to proceed.

3. The Owner hereby agrees to pay to the Contractor for the faithful performance of this contract, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States, such unit/or lump sum prices as are set forth in the accepted Proposal for quantities of each item actually accomplished. The Contractor shall repair or replace all defective work promptly and at no cost, charge or expense to the Owner. The warranty and guaranty, as provided for in this paragraph, are in addition to and not in limitation of any other bond, warranty or guaranty provided to the Owner by the Contractor or by a manufacturer, supplier or otherwise, or any other cause of action, right or remedy.

4. The Owner shall make partial payments to the Contractor on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the Contractor, less the specified retainage. All work must be performed strictly in accordance with this Contract and all work is subject to acceptance by the Owner.

5. Upon submission by the Contractor of evidence satisfactory to the Owner that all payrolls, materials, bills and other cost incurred by the Contractor in connection with the construction of the work have been paid in full, final payment on account of this Contract shall be made within thirty (30) days after the completion by the Contractor of all work covered by this Contract and the acceptance of such work by the Owner.

6. If at any time after the execution of this Contract and the bonds hereto attached; the Owner shall deem the surety or sureties upon such bond or bonds to be unsatisfactory, or if for any reason any such bond ceases to be adequate to cover the performance of the work or the payment for labor or materials, the Contractor shall, at his expense and within five (5) days after the receipt of notice from the Owner to do so, furnish an additional bond or bonds in such form and amount and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Contract until such new or additional bonds shall have been furnished in a manner and form satisfactory to the Owner.

7. In respect to each phase of the work and for one (1) year from and after the date on which such phase is accepted for use by the Owner, or for such longer period as may be provided for in any written warranty or guaranty, the Contractor warrants and guarantees the work (including but not limited to all labor and materials in respect thereto); and the Contractor shall repair or replace all defective work promptly and at no cost, charge or expense to the Owner. The warranty and guaranty, as provided for in this paragraph, are in addition to and not in limitation of any other bond, warranty or guaranty provided to the Owner by the Contractor or by a manufacturer, supplier or otherwise, or any other cause of action, right or remedy.

8. The Owner may in its sole discretion suspend this Contract for ninety (90) days or terminate this Contract at any time, whereupon the Contractor shall be paid only for the work actually performed, the materials actually delivered to the job site, and the materials specifically ordered by the Contractor for this project if such specifically ordered materials cannot be returned to the manufacturer or supplier by the Contractor at no cost or expense to the Contractor. (It is understood, however, that the Contractor shall return all specifically ordered materials if the Owner agrees in writing to reimburse the Contractor for all of the latter's costs and expenses incurred in so returning the materials.) The Contractor shall not be entitled to recover any anticipated profits. This paragraph applies only to those situations where the Owner suspends or terminates this Contract for reasons other than the Contractor's performance or breach of or default under this Contract.

9. This Contract is made and entered into in, Elizabethtown, North Carolina, and North Carolina law shall govern and apply to this Contract. In the event of a dispute or disputes between the parties hereto, and in the event litigation is instituted, such litigation shall be commenced only in a state superior or district court in Elizabethtown, North Carolina, and each party hereby waives any right or claim for a change of venue from Elizabethtown, North Carolina.

10. Regardless of which party hereto is responsible for the preparation and drafting of this Contract, it shall not be construed more strictly against either party.

11. Whenever the context permits, words herein in any gender shall include the masculine, feminine and neuter.

12. This Contract may not be assigned by the Contractor unless the Owner has consented in

writing to the assignment.

13. The parties hereto acknowledge, represent, state and warrant that they have signed and executed this Contract under seal, that they have adopted their respective seals as affixed to this Contract, and that they are executing this Contract with the intent that it shall be a sealed instrument.

IN WITNESS WHEREOF, the Owner and Contractor hereto have executed this contract on the date first above written in six counterparts, each of which shall be deemed an original contract.

WITNESS:

_____	_____
(As to Contractor)	(Contractor) (Seal)
WITNESS:	By_____
_____	Town of Elizabethtown, North Carolina
(Secretary – Treasurer)	(Owner) (Seal)
	By_____

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Finance Officer

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PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That _____as Principal, hereinafter called Contractor, and _____as Surety, hereinafter called Surety, are held and firmly bound unto Town of Elizabethtown, as Obligee, hereinafter called Owner, in the amount of _____ Dollars ($_____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____, 202__, entered into a contract with the Owner for the Multi-Unit Hangar, Phase 1 in accordance with Drawings and Specifications prepared by W.K. Dickson & Co., LLC which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

(1) Complete the Contract in accordance with its terms and conditions, or

(2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, 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 amount set forth in the first paragraph hereof. 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, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of (2) two years from the date on which final payment under the Contract falls due.

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 heirs, executors, administrators or successors of the Owner.

Signed and sealed this _____ day of _____ , 202__.

_____	_____	
(Witness)	(Principal)	(Seal)
	_____	
	(Title)	
_____	_____	
(Witness)	(Surety)	(Seal)
	_____	
	(Title)	

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That _____ as Principal, hereinafter called Principal, and _____ as Surety, hereinafter called Surety, are held and firmly bound unto Town of Elizabethtown, as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of _____ _____ dollars ($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 202__, entered into a contract with the Owner for the Multi-Unit Hangar, Phase 1 in accordance with Drawings and Specifications prepared by W.K. Dickson & Co., Inc. which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental or equipment directly applicable to the Contract.

2. The above-named Principal and Surety hereby jointly and severally agree with the Owner that every Claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant.

a. Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above-named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

b. After the expiration of two (2) years following the date on which Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be

equal to the minimum period of limitation permitted by such law.

c. Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this _____ day of _____, 202__.

_____	_____
(Witness)	(Principal) (Seal)
	_____
	(Title)
_____	_____
(Witness)	(Surety) (Seal)
	_____
	(Title)

DIVISION II

GENERAL 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.

Paragraph Number	Term	Definition
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: 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

Paragraph Number	Term	Definition
		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 to

Paragraph Number	Term	Definition
		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 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.

Paragraph Number	Term	Definition
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 **Town of Elizabethtown, North Carolina**.
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 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.

Paragraph Number	Term	Definition
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 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. 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 field observations, 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

Paragraph Number	Term	Definition
		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 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 Engineer, 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.

Paragraph Number	Term	Definition
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

SECTION 20

PROPOSAL REQUIREMENTS AND CONDITIONS

20-01 Advertisement (Notice to Bidders).

A copy of the advertisement is included in Division I, Contract Requirements.

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.

A bidder may also submit evidence that they are prequalified with the State Highway Department and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Department 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*.

A pre-bid 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. The pre-bid conference will be held at the time, date, and location indicated in the Instructions to Bidders.

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 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.

Prices should generally be written in whole dollars and cents. The extended total amount of each item should not be rounded.

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 guaranty. 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, business address and state contractor's license 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 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

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 120 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 lowest responsible bidder whose bid, conforming with all the material terms and conditions of the bid documents, is the lowest in price. The lowest price will be determined based on Bid Schedule 1: 160'x60' Hangar.

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 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 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 Engineer's opinion, is necessary for completion of the extra work.

When determined by the Engineer to be in the Owner's best interest, the Engineer 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, Engineer 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 Engineer shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the Engineer 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 Engineer 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 Engineer; 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 Engineer's approval in advance of such use.

Should the Engineer 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 Engineer 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

SECTION 50

CONTROL OF WORK

50-01 Authority of the Engineer. The Engineer has final authority regarding the interpretation of project specification requirements. The Engineer 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 Engineer 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 Engineer 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 Engineer will advise the Owner of their determination that the affected work be accepted and remain in place. The Engineer 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 Engineer 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 Engineer'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 Engineer'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 Engineer'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 Engineer 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.

All change orders, supplemental agreements, and contract modifications must eventually be reviewed by the FAA. Unless specifically requested by the FAA, the Owner does not have to obtain prior FAA approval for contract changes except for the Buy American review, if required. However, if an Owner proceeds with contract changes without FAA approval, it is at the Owner’s risk.

The Engineer 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 Engineer 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.

50-05 Cooperation of Contractor. The Contractor shall be supplied with **[five]** hard copies or 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 Engineer 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 Engineer 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 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. The Contractor is responsible for preserving integrity of horizontal and vertical controls established by Engineer. 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 Engineer 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 Engineer. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the Engineer for each area of construction and for each placement of material as specified to allow the Engineer 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 Engineer prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in a format acceptable to the Engineer.

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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans or as established by the Engineer, 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 Engineer made under the provisions of this subsection, the Engineer 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 Engineer 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 Engineer'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 Engineer to make final inspection of that unit. If the Engineer finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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 Engineer 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. Not applicable to this project.

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 Engineer 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 Engineer'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 Engineer before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the Engineer 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 Engineer, 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 Engineer. 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 Engineer.

A copy of all Contractor QC test data shall be provided to the Engineer 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 Engineer 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 Engineer 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 Engineer.

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

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

60-04 Plant inspection. The Engineer 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 Engineer conduct plant inspections, the following conditions shall exist:

a. The Engineer shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

b. The Engineer 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 Engineer, 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 Engineer 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. An Engineer/RPR field office is not required.

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 Engineer. 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 Engineer. 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 Engineer 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 Engineer.

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 Engineer 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

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:

Town of Elizabethtown Public Works
Stephen Duffy, Director
401 W Swanzy St
Elizabethtown, NC 28337
Ph: 910-862-2035

Four County Electric
Greg Mobley, Field Engineering Staking Supervisor
PO Box 275
2668 Highway 242 South
Elizabethtown, NC 28337
Ph: 910-259-1855

Star Communications
PO Box 348
Clinton, NC 28329
Ph: 800-706-6538

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 Engineer.

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 Engineer, 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 Engineer. If the Engineer 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 Engineer 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 on sheet **G101** of 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 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 Engineer, 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 150/5370-2G 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 Engineer'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.

The plans shall show the approximate location of the utilities or facilities known to exist within the limits of the contract work. The proposed contract plans and specifications shall be coordinated with the various Owners at the earliest possible time to avoid overlooking utility conflicts in the design and to obtain the best possible information needed to protect such utility services or facilities from damage resulting from the Contractor's operations. Where conflicts are indicated during the coordination, they shall be resolved by the airport Owner and the utility owner, in accordance with existing legal agreements, by providing for work in the proposed contract or by the utility owner. In such cases of conflict, regardless of how the conflict is resolved, the airport Owner and utility owner should also be advised of the need to furnish the best information possible as to location of the utility service or facility to ensure protection during the proposed contract work.

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 Engineer.

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 Engineer.

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 Engineer 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 Engineer 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. This section is not applicable to this project.

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, Engineer, 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 Engineer. The Engineer 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 the Special Provision section included herein which includes information related to insurance requirements.

END OF SECTION 70

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 Engineer.

The Contractor shall perform, with his organization, an amount of work equal to at least **25** 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 Engineer 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 **10** days of the NTP date. The Contractor shall notify the Engineer at least 24 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 Engineer’s review and acceptance at least 10 days prior to the start of work. The Contractor’s progress schedule, once accepted by the Engineer, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The Engineer 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 Engineer’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 Engineer at least 24 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 project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall show all work items identified in the project proposal for each work area and shall include the project start date and end date.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a twice monthly 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 Engineer) at least **[** 48 hours **]** prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the Engineer 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 150/5370-2G, 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 Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, 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 Engineer.

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 Engineer 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 Engineer. 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 Engineer 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 Engineer determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this 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 Engineer within the time period stated in the

Engineer's order to resume work. The Contractor shall submit with their own claim information substantiating the amount shown on the claim. The Engineer 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 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.

Bid Schedule	Liquidated Damages Cost	Allowed Construction Time
Bid Schedule 1: 160'x60' Hangar	$1,000/Calendar Day	180 Calendar Days
Bid Schedule 2: 80'x80' Hangar	$1,000/Calendar Day	130 Calendar Days

The maximum construction time allowed is shown in the above table. 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 Engineer 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 Engineer 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 Engineer.

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 Engineer 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

SECTION 90

MEASUREMENT AND PAYMENT

90-01 Measurement of quantities. All work completed under the contract will be measured by the Engineer, 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 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 Engineer.

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 Engineer in writing, material specified to be measured by the cubic yard may be weighed, and such weights will be converted to cubic yards payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer 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 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 Engineer. 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 Engineer 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

Term	Description
	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 or ton. When measured by volume, such volumes will be measured at 60°F or will be corrected to the volume at 60°F using ASTM D1250 for asphalts. 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.
Cement	Cement will be measured by the ton or hundredweight
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 Engineer 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. The use of spring balances will not be permitted.

Term	Description
	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 Engineer can safely and conveniently view them. Scale installations shall have available ten standard 50-pound 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 Engineer. 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 Engineer 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 Engineer 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 Engineer'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 Engineer'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 Engineer'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 Engineer, 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 Engineer 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 Engineer, the Engineer 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 Engineer 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 Engineer at or on an approved site.

b. The Contractor has furnished the Engineer with acceptable evidence of the quantity and quality of such stored or stockpiled materials.

c. The Contractor has furnished the Engineer 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 Engineer will prepare the final estimate of the items of work actually performed. The Contractor shall approve the Engineer's final estimate or advise the Engineer 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 Engineer 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 Engineer's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the Engineer'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 Engineer's final estimate, and after the Engineer'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. However, this will not

relieve the Contractor from corrective items required by the final acceptance of the project work. Light Emitting Diode emitting diode (LED) light fixtures with the exception of obstruction lighting, must be warranted by the manufacturer for a minimum of four (4) years after date of installation inclusive of all electronics.

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.

(1) 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.

g. 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 Engineer 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

DIVISION III

SPECIAL PROVISIONS

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SPECIAL PROVISIONS

1. GENERAL

1.1. These Special Provisions are supplemental to the General Provisions and shall be considered as a part of the Contract Documents.

2. SHOP DRAWINGS

2.1. The Contractor shall submit to the Engineer all shop drawings required for the work. The Contractor shall carefully review all shop drawings for accuracy and conformance to the Contract Documents. The Contractor shall clearly indicate:

2.1.1. the products and materials being submitted for review

2.1.2. reference specification and

2.1.3. the Contractor's stamp of approval before being forwarded to the Engineer

2.2. Six copies of all shop drawings shall be submitted to the Engineer in a timely manner so as to cause no delay to any part of the work. The Engineer shall review all shop drawings with reasonable promptness, and shall approve or note thereon any desired corrections. The Engineer shall retain two (2) copies of the shop drawings and shall return the remaining four (4) copies to the Contractor.

2.2.1. If the shop drawings are returned without approval, the Contractor shall then make the required corrections and shall re-submit another six (6) copies of the corrected drawings to the Engineer. The Engineer shall retain two (2) copies of the corrected drawings. If additional corrections are required, then the Contractor shall resubmit as above.

2.3. Review of shop drawings by the Engineer shall not relieve the Contractor from responsibility for compliance with terms or designs of the Contract Documents nor from responsibility for errors of any sort in the shop drawings. The contractor is solely responsible for meeting the construction/installation requirements of the project.

3. COORDINATION, INTERPRETATION AND INTENT OF CONTRACT DOCUMENTS

3.1. It is the intent of the Specifications and the Plans to describe a complete project in accordance with the Contract Documents. The Contract Documents comprise the entire Contract between the Owner and the Contractor. They may be altered only by a written change order or Supplemental Agreement.

3.2. See section **50-03 COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS in the General Provisions.**

3.3. Dimensions on plans shall govern over general drawings, and detailed drawings shall govern over general drawings.

4. INSURANCE

4.1. The Contract shall not be executed by the Contractor and Owner until the Contractor has obtained, at his sole expense, all required insurance policies and certificates and such policies and certificates have been approved by the Engineer Contractor shall not allow any Subcontractor to commence work on his subcontract until all insurance required to be procured by the Subcontractor hereunder has been so obtained by or for the Subcontractor. If a Subcontractor does not take out insurance in his own name and the Contractor wishes to provide insurance protection for such Subcontractor and such Subcontractor's employees, the Contractor must either

4.1.1. Procure appropriate policies in the name of the Subcontractor, or

4.1.2. Cause a rider to be attached to the Contractor's policies which must identify the Subcontractor as an "additional insured". Such rider need not be attached to the Contractor's workers compensation policy if that policy is sufficiently broad to cover all employees of all Subcontractors performing work under the contract. All required insurance shall be procured from insurance companies licensed to do business in North Carolina and shall be maintained continuously during the life of the contract.

4.2. **Worker's Compensation Insurance** - The Contractor shall take out and maintain during the life of this contract, worker's compensation insurance for all of his employees employed at the site of the project. In case any class of persons engaged in work under this Contract is not protected under the worker's compensation laws, the Contractor shall provide all adequate coverage for the protection of his employees not otherwise protected.

4.3. **Comprehensive General Liability and Property Damage Insurance** - The Contractor shall take out and maintain during the life of this Contract such public liability and property damage insurance as shall protect him and the Owner from claims for damages for personal injury, including death, as well as from claims for property damages which may arise from operations under this contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by either of them, and the amounts of such insurance shall be as follows:

4.3.1. comprehensive General Liability Insurance not less than $1,000,000 for accidental injury or death on account of any one occurrence, and

4.3.2. Property Damage Insurance of not less than $1,000,000 for each occurrence.

4.3.3. The Owner and the Engineer shall be named as additional insureds.

4.4. **Comprehensive Automobile Liability Insurance -** The Contractor shall procure and maintain during the life of the Contract complete comprehensive automobile liability insurance in the amounts of $300,000 each occurrence for bodily injury or death, and $300,000 each occurrence for property damage.

4.4.1. The Owner and the Engineer shall be named as additional insureds.

4.5. **Umbrella Excess Liability Insurance** - In addition to the requirements of the above paragraphs, the Contractor will be responsible for procuring and maintaining during the life of

the Contract an umbrella excess liability policy in the amount of $5,000,000, providing excess coverage on insurance required in Paragraphs 4.3 and 4.4 above.

4.5.1. The Owner and the Engineer shall be named as additional insureds.

4.6. Unless provided otherwise, Each and every Subcontractor performing work covered by this Contract shall procure and maintain insurance of the types and in the amounts specified and prescribed above. It shall be the Contractor's responsibility to ensure that each Subcontractor procures and maintains the required insurance. If for any reason, such insurance is not provided and maintained in full force, the Contractor shall indemnify and save harmless the Owner and the Engineer from any damages resulting therefrom.

4.7. The Contractor shall require each Subcontractor to submit certificates of insurance coverage to the Contractor as evidence required coverage before such Subcontractor commences work on the project. The Contractor shall submit to the Engineer before the Contract is executed certificates of insurance evidencing coverage required to be procured by the Contractor hereunder. The Contractor shall submit evidence of Subcontractor coverage for each Subcontractor before that Subcontractor commences work on the project.

4.8. Each certificate of Insurance and each insurance policy (except worker's compensation) shall bear the provision that

4.8.1. "The policy cannot be canceled, reduced in amount or coverage eliminated in less than 30 days after written notice is mailed (via certified mail) to the Owner, the insured, the Contractor (unless the Contractor is the insured) and the Engineer of such alteration, cancellation, or elimination."

4.8.2. This provision is to be enforced at all times.

4.9. A provision regarding cancellations, reductions in amount or elimination of coverage to the effect that the insurer's failure to mail notice will impose no liability upon the insurer will not be acceptable. If an insurance policy is canceled, it will be the Contractor's obligation to procure a replacement policy at the Contractor's expense.

5. CONTRACTOR

5.1. The Contractor shall supervise and direct the work efficiently and with his best skill and attention. He is solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor will be responsible to see that the finished work complies accurately with the Contract Documents.

5.2. The Contractor will employ on the project at all times during its progress, a competent resident superintendent whose name and qualifications will be furnished to the Engineer at the preconstruction meeting and who shall not be replaced without prior written notice to the Engineer except under extraordinary circumstances, in which event immediate written notice shall be given to the Engineer. The superintendent will be the Contractor's representative at the site and shall have good communication skills and the authority to act on behalf of the Contractor and to receive any and all notices or instructions given pursuant to the Contract Documents. The superintendent shall be an employee of the Contractor. The Contractor will

provide competent and suitable qualified personnel, equipment and supplies to perform the work required by the Contract Documents and will at all times maintain good discipline and order at the site.

5.3. The Contractor will provide competent, suitably qualified personnel, equipment and supplies to survey and layout the work as required by the Contract Documents.

5.4. The Contractor shall attend job site progress conferences as called by the Engineer. The Contractor shall be represented at these job progress conferences by an authorized representative of the home office of the Contractor as well as by the resident superintendent. These meetings shall be open to Subcontractors, material suppliers and any others who can contribute beneficially toward maintaining required job progress, and such personnel shall be encouraged by the Contractor to attend. It shall be the principal purpose of these meetings or conferences to effect coordination, cooperation and assistance in every practical way to facilitate maintaining progress of the project on schedule and to complete the project within the approved schedule. The Contractor shall be prepared to assess progress of the work as required in the Contract and to recommend remedial measures for correction of progress as may be appropriate. The Engineer shall be the coordinator of the conferences and shall preside as chairperson.

5.5. It shall be the responsibility of the Contractor to schedule the work of all Subcontractors and suppliers to conform to the Construction Schedule submitted by the Contractor at the preconstruction meeting and approved by the Engineer and Owner; to maintain such construction schedule; and to notify the Engineer of any changes in the Construction Schedule. If the Contractor falls significantly behind the Construction Schedule, he shall, upon the Engineer's request, submit the following:

5.5.1. a revised schedule for completion of work within the Contract time, such revised schedule shall be subject to approval by the Engineer and Owner, and,

5.5.2. any other supporting data the Engineer and/or Owner may require.

5.5.3. The Contractor shall modify his operations to provide such additional materials, equipment and labor necessary to meet such approved revised schedule. He shall be responsible for providing adequate notice to all Subcontractors to ensure efficient continuity of all phases of the project work.

5.6. In the event that the prosecution of the work is discontinued for any reason, the Contractor shall notify the Engineer at least forty-eight (48) hours in advance of resuming operations.

5.7. If in the opinion of the Engineer, any Subcontractor on the project proves to be incompetent or otherwise unsatisfactory, he shall be replaced by the Contractor if and when so directed by the Engineer in writing.

5.8. The Contractor will maintain one record copy of all Specifications, plans, addenda, modifications, and shop drawings at the site in good order and annotated to show all changes made during the construction process. These shall be available to the Engineer and shall be delivered to him/her for the Owner's purposes upon completion of the project. They shall be used for this purpose only.

5.9. The Contractor shall be responsible for the entire site and the necessary protections, as required by the Engineer and by laws or ordinances governing such conditions. He shall be responsible for any damage to the Owner's property, or that of others, by the Contractor, his employees, Subcontractors or their employees, and shall make good such damages. He shall hold harmless the Owner and Engineer for any such claims.

5.10. The Contractor shall provide cover and/or protect all portions of the work and provide all materials necessary to protect the work whether performed by him/her or any of the Subcontractors. Any work damaged through the lack of proper protection, or from any other cause, shall be repaired or replaced without extra cost to the Owner.

5.11. The Contractor shall maintain the work during construction and until the work is accepted. This 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. All costs of maintenance work during the 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.

5.12. Should the Contractor at any time fail to maintain the work as provided herein, the Engineer 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 Engineer's notification, the Engineer may suspend any work necessary for the Owner to correct such unsatisfactory condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner shall be deducted from monies due or to become due the Contractor.

5.13. Burning will not be allowed.

5.14. The Contractor shall designate a responsible member of his organization as safety inspector, whose duties shall include accident prevention on the project. The name of the safety inspector shall be made known to the Engineer at the pre-construction conference. Safety requirements outlined in the General Provisions must be strictly enforced.

5.15. In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Contractor, without special instructions or authorization from the Engineer or Owner, is obligated to act at his discretion to prevent threatened damage, injury or loss. As soon as practicable, he will notify the Engineer of such emergency and he will thereafter act at the Engineer's instruction. The Contractor will give the Engineer prompt written notice of any significant changes in the work or deviations from the Contract Documents caused by such emergency, and a change order, if found by the Engineer to be justified, shall thereupon be issued covering the changes and deviations involved. If the Contractor believes that additional work completed during an emergency entitles him/her to an increase in the Contract price or an extension of the Contract time, he may make a claim therefore as provided in the General Provisions.

5.16. The Contractor shall keep the premises free from accumulation of waste materials or rubbish caused by the work at all times. At the completion of the work, he shall remove any residual

waste materials and rubbish from and about the project as well as all tools, construction equipment, machinery and surplus materials. If the Contractor fails to clean up at the completion of the work, the Owner may do so and the cost thereof shall be charged to the Contractor. The Contractor shall leave the work in condition for occupancy by the Owner such that no cleaning or other operations are required. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily.

5.17. Utilities, Structures and Signs shall be provided as follows:

5.17.1. Temporary Structures

5.17.1.1. The Contractor shall provide all necessary storage sheds, shanties, and other similar structures required for his own use. Temporary structures shall be placed as directed by the Engineer and shall be built in a sound waterproof manner and shall remain on the premises until the Engineer directs their removal. Requirements of applicable local codes and ordinances shall apply.

5.17.2. Water

5.17.2.1. The Contractor shall consult with the Engineer in regard to water supply. A source and manner for obtaining water shall be approved by the Engineer before any water is secured. Any expenses of securing water shall be borne by the Contractor. Requirements of applicable local codes and ordinances shall apply.

5.17.3. Electricity

5.17.3.1. The Contractor shall consult with the Engineer in regard to electrical service. Any expenses of securing construction electrical service from the source of supply shall be borne by the Contractor. The Engineer shall approve the source of supply. If the Contractor constructs any temporary structures and/or field office(s) that require the installation of electrical service, the Contractor shall pay for electrical energy used in such facility at the rates of the utility company furnishing power. Requirements of applicable local codes and ordinances shall apply.

5.18. Signs

5.18.1. Directional signs may be erected on the Owner's property subject to the approval of the Engineer with respect to size, type, and location of such directional signs. Such signs may bear the name of the Contractor and a directional symbol.

5.18.2. A project bulletin board shall be erected and maintained by the Contractor that is waterproof and of sufficient size to post bulletins, wage and labor requirements, DBE requirements and other related information. The size, style and location of this bulletin board must be approved by the Engineer prior to its installation.

5.18.3. No other signs will be permitted unless approved by the Engineer.

5.18.4. Requirements of applicable local codes and ordinances shall apply to any posted signs.

5.19. Use of the terminal buildings and facilities located in and around said terminal area by employees of the Contractor and his Subcontractors and material and equipment suppliers shall be prohibited, except upon written permission from the Engineer.

5.20. 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 constriction shall be limited as directed by the Engineer. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor shall be responsible for all damage done by his hauling equipment on or off the airport and shall correct such damage at his own expense.

6. OWNER

6.1. The Owner will issue all communications to the Contractor through the Engineer.

6.2. In case of termination of the employment of the Engineer, the Owner will appoint another Engineer who will have and assume all rights and duties held by the original Engineer named herein.

6.3. The Owner shall have the right to take possession of and use any portion of the work notwithstanding the fact that the time for completion of such portion of the work may not have expired but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. Should the Owner take possession of and use any portion of the work for which the time for completion has not yet expired and should the Contractor believe that such prior use increases the cost or delays in the work, he may make a claim for an increase in the Contract price and/or for an extension of time as provided the General Provisions.

6.4. A waiver on the part of the Owner for any breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

7. TESTING AND SURVEYING

7.1. Field surveys shall be made by the Contractor to determine compliance of construction with the Plans and Specifications and for quantity measurements. The Owner will incur the costs of routine compliance and measurement surveys performed during the ordinary course of construction. However, the Contractor shall pay for all costs of additional field surveys required due to inconsistent or inaccurate construction techniques, or performance of unacceptable or unauthorized work, or any other reason determined by the Engineer to be principally the cause of the Contractor. Said additional surveys are not considered to be routine. Work found to be unacceptable or unauthorized shall not be paid for and, if directed by the Engineer, shall be removed at the Contractor's expense.

7.2. The Contractor will be provided horizontal and vertical control points by the Engineer. The Contractor must furnish, at his expense, all additional stakes and materials for layout and construction of the work.

7.3. The Contractor shall provide Quality Control Testing as required to record that the project materials have been constructed per the requirements of the plans and specifications.

7.4. Owner will provide quality assurance testing as required by the specifications. Quality assurance testing will be completed when Contractor notifies the Engineer that materials have been constructed per the requirements of the plans and specifications and items are ready for testing. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by the Engineer. Payment for re-testing or re-inspection will be charged to the Contractor by deducting testing charges from the contract price.

8. CHANGE OF THE CONTRACT PRICE

8.1. The Contract Price constitutes the total compensation payable to the Contractor for performing the work subject to additions and deductions as provided in the Contract Documents. All duties, responsibilities and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Price. Except as otherwise specified, the Contract Price may only be changed by a Change Order, or Supplemental Agreement.

8.2. The Contractor shall not act on instructions received by him from persons other than the Engineer, and any claims for extra compensation on account of such instructions will not be honored.

8.3. In determining the amount of Contract Price adjustment, the parties shall apply the following methods, as appropriate:

8.3.1. Emergency Work: In the event of emergency endangering life or property, the Contractor may be directed by the Engineer to proceed on a time and material basis whereupon the Contractor shall so proceed and keep accurately in such form as may be required, a correct account of costs together with all proper invoices, payrolls, and supporting data therefore.

8.3.2. Claims for Increase: Where the Engineer and Owner, upon receipt of a proper claim for increase in Contract Price determine that an increase is warranted and where none of the above methods of Contract Price adjustment are applicable, the amount of increase shall be determined by negotiation between the Contractor and the Engineer, subject to final approval by the Owner.

9. CORRECTION OF WORK BEFORE FINAL PAYMENT

9.1. Any work, materials, fabricated items, or other parts of the work which have been found by the Engineer to be faulty or not in accordance with the Contract Documents shall be removed from the work site by the Contractor, and immediately replaced by new work in accordance with the Contract at no additional cost to the Owner. Work or property of the Owner or others damaged or destroyed by virtue of such condemned work shall be made good at the expense of the Contractor.

9.2. Correction of condemned work described above shall commence by the Contractor immediately after notice from the Engineer and shall be pursued to completion.

9.3. Final payment will not be made until the Engineer has approved such corrections.

9.4. Should the Contractor fail to proceed reasonably with the above-mentioned corrections within 24 hours of receiving notice from the Engineer, the Owner may proceed with corrections, paying the cost of same from amounts due or to become due to the Contractor. Condemned work so removed shall be the property of the Contractor, and shall be removed from the site of the work by him within five (5) days after notice to remove it, or thereafter may be disposed of by the Owner without compensation to the Contractor. The cost of such disposal shall be deducted from amounts due or to become due to the Contractor.

9.5. Should the cost of correction of the work and, if applicable, disposal of the condemned work by Owner exceed amounts due or to become due the Contractor, then the Contractor and his surety shall be liable for and shall pay to the Owner the amount of said excess.

10. CORRECTION OF WORK AFTER FINAL PAYMENT

10.1. Neither the final certificate, final payment, occupation of the premises by the Owner, nor any provision of the Contract, nor any other act or instrument of the Owner or the Engineer shall relieve the Contractor from responsibility for negligence, or faulty material or workmanship, or failure to comply with the Plans and Specifications. He shall correct or make good any defects due thereto and repair any damage resulting therefrom which may appear during a period of twelve (12) months following final acceptance of the work except as stated otherwise under the provisions of the Contract Documents. The Owner will report any defects as they may appear to the Engineer, who will give instructions and a time limit for completion of corrections to the Contractor, which instructions shall be binding upon the Contractor. The Engineer will be the judge as to the responsibility for correction of defects.

11. OWNER'S RIGHT TO DO WORK

11.1. If, during the progress of the work or during the period of guarantee, the Contractor fails to prosecute the work properly or to perform any provision of the contract, the Owner, after written notice to the Contractor from the Engineer or Owner, may perform or have performed that portion of the work and may deduct the cost thereof from any amounts due or to become due the Contractor.

11.2. Should the cost of such action of the Owner exceed the amount due or to become due the Contractor, then the Contractor and his surety shall be liable for and shall pay to the Owner the amount of said excess.

12. CONTRACTOR, SUBCONTRACTOR & SUPPLIER AFFIDAVIT

12.1. The final payment of retained amounts due the Contractor under this Contract shall not become due until the Contractor has furnished to the Owner through the Engineer:

12.1.1. an affidavit, signed, sworn, and notarized by the Contractor to the effect that all payments for materials, services, or for any other reason in connection with this Contract have been satisfied and that no claims or liens exist against the Contractor in connection with this contract; and

12.1.2. affidavits from each Subcontractor, of any tier, and supplier signed, sworn and notarized to the effect that:

12.1.2.1. each such Subcontractor or supplier has been paid in full by the Contractor for all work performed and/or materials supplied by him/her in connection with the project, and

12.1.2.2. that all payments for materials, services, and for any other reason in connection with his subcontract or supply contract have been satisfied and that no claims or liens exist against the Subcontractor or supplier in connection therewith.

12.2. In the event that the Contractor cannot obtain similar affidavits from Subcontractors or suppliers to protect the Contractor and the Owner from possible liens or claims against the Subcontractors or suppliers, the Contractor shall state in his affidavit that no claims or liens exist against any Subcontractor or supplier to the best of the Contractor's knowledge, and that if any appear afterwards, the Contractor shall save the Owner harmless on account thereof.

13. USE OF PREMISES

13.1. The Contractor shall confine his apparatus, the storage of materials and the operations of his workers to limits indicated by law, ordinances, permits and directions of the Engineer and shall not exceed those established limits in his operation.

13.2. The Contractor shall not load or permit any part of any structure to be loaded with a weight that will endanger its safety.

13.3. The Contractor shall enforce all of the Engineer's instructions, including, but not limited to, those regarding signs, advertisements, fires and smoking.

14. LIMITATIONS OF WORK AREA

14.1. Limited parking areas, for employees of the Contractor and the Subcontractors, shall be designated in the vicinity of the project, and it shall be the responsibility of the Contractor to require such employees to park in this designated area and not any area which may interfere with the operations in and around the construction site or the airport.

14.2. The Contractor and his employees and all Subcontractors and their employees shall be aware of the security procedures in effect in the work area. Full responsibilities will be explained at the preconstruction meeting.

15. CUTTING, PATCHING AND FITTING

15.1. The Contractor shall do all cutting, fitting and patching of his work that may be required to make its several parts come together properly and fit it to receive or to be received by work shown upon or which can be reasonably implied from the Plans and Specifications for the completed project and to fit the project to existing facilities surrounding the work area.

16. DISPUTE RESOLUTION

16.1. In the event of any dispute, claim, question or disagreement arising out of or relating to this Agreement or breach thereof, the parties hereto shall use their best effort to settle such matter by mutual agreement. To this effect, responsible, authorized representatives of the parties shall meet, consult, and negotiate with each other in good faith, and, recognizing their mutual interests, attempt to reach a joint and equitable solution satisfactory to both parties. If they do not reach such solution within a period of thirty (30) days after the first notice by either party to the other of the existence of the dispute, and upon the notice of either party to the other, the dispute shall be resolved by proceeding with the dispute resolution procedures set forth herein below.

16.2. If the parties fail to agree on the resolution of any dispute through the negotiation process above, the parties shall proceed in good faith to attempt to settle the dispute through mediation under the Construction Industry Mediation Rules of the American Arbitration Association ("AAA"), subject to and in accordance with its rules governing the mediation of such disputes. Any party who chooses to first refer the dispute to mediation may, in its notice to the other, elect to refer the matter to either the AAA or to the CIDRS for mediation. Mediation is a precondition to further dispute resolution by the parties, and the dispute resolution procedure set forth herein below shall only be available following a declaration of "impasse" by a mediator or by the mutual agreement of the parties.

16.3. If "impasse" is declared in any mediated dispute, the matter shall be submitted to arbitration with the AAA or Construction Industry Rules of the CIDRS. Notice of intent to seek arbitration of any unresolved dispute shall be given by the claiming party within ten (10) days of the declaration of impasse. The responding party shall select either AAA or CIDRS within seven (7) days of the receipt of the notice of intent to arbitrate.

16.4. The following additional rules and procedures shall apply to all disputes arising under this Agreement and shall be in addition to or, in the case of any conflict with, shall be in lieu of the applicable rules of the AAA or CIDRS:

16.4.1. The parties acknowledge that this Agreement may evidence a transaction involving interstate commerce. Nonetheless, in rendering the award, the arbitrator(s) shall determine the rights and obligations of the parties according to substantive and procedural laws of North Carolina.

16.4.2. All negotiations and mediation sessions and all arbitration hearings shall take place in the offices of the Airport, or such other place as the parties may agree upon.

16.4.3. In the arbitration of any dispute less than $100,000, the sole arbitrator shall be a retired North Carolina or Federal Judge residing in North Carolina. In disputes of $100,000 or more, an arbitration panel of three (3) experienced construction industry professionals shall be appointed and shall include

16.4.3.1. one architect or Engineer,

16.4.3.2. one construction attorney or retired State or Federal Judge residing in North Carolina, and

16.4.3.3. either one construction industry executive or a senior staff representative of a public or private Owner of a facility of the kind described in this Agreement.

16.5. The Owner, the Contractor, all Subcontractors, material suppliers, engineers, designers, architects, and their respective bonding companies and insurers and all other parties concerned with the construction of the improvements described in this Agreement are bound by this Dispute Resolution Clause to the greatest extent permitted by law, and all such parties consent and agree to the consolidation of all phases of the dispute resolution process hereunder with the dispute resolution proceedings pending among other parties whenever such proceeding arises out of the same transaction or are related to the same subject matter. The motion to consolidate may be made by any interested party and will be by an order of the arbitrator(s)' petitioned If such arbitrator(s) fail to make such order, parties may apply to the local Superior Court for such order.

16.6. At any time in the dispute resolution proceeding, the parties may agree to a high/low limitation which shall be binding upon all further proceedings.

16.7. Discovery procedures may not be undertaken during negotiations or mediation phases. However, the parties shall proceed in good faith to make disclosures to the other party of all facts, documents, records and other evidence upon which each party bases its claim or defense.

16.8. Prior to any arbitration hearing, limited discovery shall be permitted for the purpose of obtaining production of documents and taking depositions. The Rules of Civil Procedure imposed by North Carolina shall govern all discovery. The arbitrator(s) shall decide all issues regarding conformation with discovery requests. Request for discovery shall be initiated within thirty (30) days after the notice of intent to arbitrate is given and shall be fully responded to within thirty (30) days after receipt. All discovery, including depositions, shall be completed within seventy-five (75) days of the notice of intent to arbitrate or the arbitrator(s) or either party shall extend or reduce the time for discovery.

16.9. Upon request of either party made prior to the initial hearing the arbitrators' award shall be in writing and shall include findings of fact and conclusions of law, which support the award.

16.10. Either party may appeal the arbitration award to appellate arbitration by filing with the AAA, within twenty (20) days after transmittal of the award, a written brief; not to exceed twenty (20) pages, stating the reason why the arbitrator(s') decision should be reversed or modified. The opposing party shall have twenty (20) days to file a responsive brief; not to exceed twenty (20) pages. An appellate arbitrator shall be appointed by the AAA and shall be a retired North Carolina Superior Court or Appellate Judge. Either party may request oral argument which must be concluded within fourteen (14) days following submission of the final brief. No additional evidentiary material may be introduced in the appellate arbitration. The appellate arbitrator shall render a written decision affirming, reversing modifying or remanding the arbitrator(s)' decision within twenty (20) days after receiving the final appellate submission. The appellate arbitrator may base its decision only on one or more of the following grounds:

16.10.1. Any ground specified in 9 U.S.C. Sections 10 or 11;

16.10.2. A material error of applicable law by the arbitrator;

16.10.3. A determination that the award was partially or wholly arbitrary or capricious.

16.10.4. The appellate arbitrator may render a final decision on appeal or may remand the matter for further proceeding by the arbitrator(s).

16.11. All fees and expenses of the mediation and of the arbitration procedures shall be borne by the parties equally. However, each party shall bear the expense of its own counsel, experts, witnesses, and preparation and presentation of proofs. Only in the case of extreme abuse of the procedure may the arbitrator(s) reallocate such costs and expenses among the parties.

16.12. The dispute resolution procedures set forth hereinabove shall be the exclusive remedies available to the parties to the Agreement to settle or resolve any and all disputes arising hereunder and any settlement or arbitral award may be enforced by an action in the Superior Court of the county in which the project resides.

17. TAXES

17.1. The Contractor shall include in the bid and shall pay all taxes (including sales or use taxes) assessed by any authority on the work or the labor and materials used therein. The Contractor understands and agrees that the Contractor is responsible for payment of any such taxes owed, and further agrees that in the case of the joint liability of the Contractor and the Owner for any such tax, the Contractor is responsible for paying the tax. The Contractor agrees to indemnify and hold harmless the Owner against any such tax liabilities. In the event the Contractor fails to pay any such tax when due and the Owner is required to pay such tax, the Contractor agrees to reimburse Owner for same and further agrees that the Owner shall have the right to set off the amount of such tax against any sum owed the Contractor. It is understood by the parties that the above section of this Contract shall apply to and be fully enforceable against the Contractor, regardless of whether it is "engaged in business" in North Carolina, is an out-of-state Contractor, or is legally domiciled and qualified to do business in this state.

17.2. The Contractor shall maintain all tax records during the life of the project and furnish the Engineer with a complete listing of all taxes paid by county, material purchased, invoice number, date, amount, etc. for all material purchased that qualifies for reimbursement of such taxes to the Owner pursuant to State and Local tax codes. The Contractor shall use the form bound in these Contract Documents for its monthly submittals. The Contractor is required to maintain a file showing taxes paid on the project for one year or turn said documents over to the Owner.

17.3. The following is a list of requirements to be followed by the Contractor in maintaining proper records and reporting North Carolina Sales and Use Tax and Local Sales and Use Tax. The Contractor shall comply fully with the requirements outlined below, in order that the Owner may recover the amount of the tax permitted under the law.

17.3.1. It shall be the Contractor's responsibility to furnish the Engineer documentary evidence showing the materials used and Sales and Use Tax paid by the Contractor and each of his Subcontractors. Such evidence shall be transmitted to the Engineer monthly with the following month's request for payment.

17.3.2. The documentary evidence shall consist of a certified statement by the Contractor and each of his Subcontractors individually showing total purchases of materials from each separate vendor and total Sales and Use Taxes paid each vendor. Certified statements must show the material purchased, invoice number (or numbers) covered and inclusive dates of such invoices.

17.3.3. Materials used from Contractor's or Subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.

17.3.4. The Contractor shall not be required to certify the Subcontractor's statements.

17.3.5. NOT USED.

17.3.6. NOT USED.

18 CONTRACTOR'S SALES TAX REPORT
STATE AND LOCAL TAXES PAID

CONTRACTOR: _____ OWNER: _____
ADDRESS: _____ PROJECT: _____
_____ FOR PERIOD: _____ To:

* County is the county of delivery or county in which the contractor directly picked up the merchandise.

VENDOR	ADDRESS	SUMMARY OF ITEMS PURCHASED	INVOICE NUMBER	INVOICE DATE	INVOICE AMOUNT	STATE TAXES	COUNTY TAXES	TOTAL TAXES	*NAME OF COUNTY

TOTAL: _____

NOTE: ATTACH COPIES OF INVOICES AS DESCRIBED ABOVE

I,_____ certify that the foregoing statement of applicable sales taxes paid in connection with the referenced contract is true to the best of my knowledge and belief.

Signed: _____ Title: _____

I, _____, Notary Public for _____ County, State of _____, do hereby certify that _____ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 20___.

_____
Notary Public (Official Seal)

Printed Name _____

My commission expires _____, 20___

19. OPERATION OF AIRPORT

19.1. Insofar as is possible, the Contractor agrees that the sequence of operations under this Contract shall be scheduled and carried out so as to ensure regular operation of the airport except for scheduled closings. The Contractor will not be allowed to close any areas for construction until so authorized by the Engineer. When the Contract work requires the Contractor to work within the areas used by aircraft and support vehicles of the airport on an intermittent basis, the Contractor shall obtain an airfield radio and constantly monitor radio communications **(Unicom Frequency 122.80)** from pilots using the airport, immediately vacate runway and taxiway areas until traffic is clear. Failure to maintain the specified communications or to obey these instructions shall be cause for suspension of the Contractor's operations in such areas until the satisfactory conditions are provided.

20. SEVERABILITY

20.1. If any provision of the Contract shall be declared invalid or unenforceable, the remainder of the Contract shall continue in full force and effect.

21. NOT USED

22. DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF RESIDENT PROJECT REPRESENTATIVE

22.1. GENERAL - The Resident Project Representative shall be the representative of the Engineer and shall act under the direction of the Engineer. The Engineer and the Engineer's Resident Project Representative shall have authority to act on behalf of the Owner only to the extent provided in the contractual agreements to which the Engineer is a party. The Resident Project Representative shall confer with the Engineer regarding their required actions at intervals and on occasions appropriate to the progress of construction. The Resident Project Representative's interaction and communications in matters pertaining to the on-site work in general shall be only with the Engineer and the Contractor. The Resident Project Representative shall communicate with Subcontractors only through, or with the full knowledge and authorization of, the Contractor or his superintendent. The Resident Project Representative shall generally communicate with the Owner only through or as directed by the Engineer.

22.2. DUTIES AND RESPONSIBILITIES - The Resident Project Representative shall:

22.2.1. Review the construction progress schedule, schedule of Shop Drawing submittals, schedule of values, schedules of equipment, materials and supplies order placement, project manpower schedule and other schedules prepared by the Contractor and consult with the Engineer, who shall likewise consult with the Owner in this same regard, concerning their acceptability. Throughout the course of the Work, he shall monitor the construction progress schedule and report to the Engineer, who shall likewise report to the Owner, any conditions which may cause delay in completion of the Work.

22.2.2. Attend the project preconstruction meeting. Schedule progress meetings and other job conferences in consultation with the Engineer and notify in advance those expected to attend. Attend meetings, including progress meetings, job conferences and any others as directed by the Engineer, maintain and circulate copies of minutes thereof, and report to the Engineer, who shall likewise report to the Owner, on the proceedings.

22.2.3. Serve as the Engineer's liaison with the Contractor, working principally through the Contractor's superintendent, and assist the Contractor in understanding the intent of the Contract Documents. Assist the Engineer in serving as the Owner's liaison with the Contractor when the Contractor's operations affect the Owner's on-site operations.

22.2.4. As requested by the Engineer, assist in obtaining from the Owner additional details or information and in making necessary arrangements and carrying out coordination of activities when required at the job site for proper execution of the Work.

22.2.5. In the interest of preserving the proper channels of communication, advise the Engineer if he is aware of any direct communication between the Owner and the Contractor.

22.2.6. Assist the Engineer in reviewing Shop Drawings, Product Data and Samples.

22.2.7. Receive and record the date of receipt of Shop Drawings and Samples and any actions subsequent to shop drawing reviews by the Engineer.

22.2.8. Receive and log Samples which are required to be furnished at the site by the Contractor for the Engineer's approval, notify the Engineer of their availability and readiness for examination, and record the Engineer's approval or other action. Maintain custody of approved samples.

22.2.9. Notify the Engineer and the Contractor or his resident superintendent immediately if any portion of the Work requiring submittal of Shop Drawings, Product Data or Samples is commenced before the Engineer has approved such submittals.

22.2.10. Conduct on-site observations and inspections of the progress and quality of the Work to determine and assist the Engineer in determining and to make certain within reason that the project is proceeding in accordance with the Contract Documents and that all work performed by the Contractor is in accordance with the intent and conforms to the requirements of the Contract Documents.

22.2.11. Notify the Engineer, who shall likewise notify the Owner, and the Contractor immediately whenever he believes that any Work in progress or completed is unsatisfactory, faulty or defective, is not in accordance with the intent and/or does not conform to the requirements of the Contract Documents, has been damaged, or does not meet the requirements of any inspections, tests or approvals required to be made.

22.2.12. Notify the Engineer, who shall likewise notify the Owner and the Contractor immediately whenever he believes that Work in progress or completed should be uncovered for observation or requires special inspection or testing.

22.2.13. Reject unsatisfactory, faulty or defective Work in progress or completed which is not in accordance with the intent and/or the requirements of the Contract Documents, immediately and directly inform the Contractor or his superintendent of such rejection, and report such rejection to the Engineer, who shall likewise notify the Owner, and require correction of such unsatisfactory, faulty or defective Work immediately or within a reasonable period of time.

22.2.14. Make certain that all unsatisfactory, faulty or defective Work previously rejected is properly corrected before being covered up by the Contractor or other Work being placed above.

22.2.15. Verify that tests, equipment and systems startups and operating and maintenance instructions are conducted or followed as required by the Contract Documents and in the presence of the required personnel, that the Contractor maintains adequate records thereof, and maintain details relative to test procedures, startups and test results. Verify the accuracy of all testing invoices which are to be paid by the Owner. Order all tests required by the Contract Documents which are to be paid for by the Owner.

22.2.16. Accompany the Owner's authorized representative and visiting inspectors representing public or other agencies having jurisdiction over the Project on visits to the Project site, record the names, titles, dates, times and outcomes relative to such inspections, and report this information to the Engineer.

22.2.17. Review the Contract Documents with the Contractor's superintendent. Obtain necessary clarifications and interpretations of the Contract Documents from the Engineer and transmit them to the Contractor.

22.2.18. Consider and evaluate the suggestions and recommendations of the Contractor for modifications to the Plans and Specifications and submit them with recommendations to the Engineer for a final decision.

22.2.19. Maintain at the job site orderly records and files for correspondence, reports of job conferences, Shop Drawings, Product Data and Sample submittals, reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders, additional or supplementary Plans issued subsequent to the execution of the Contract, the Engineer's clarifications and interpretation of the Contract Documents, progress reports, requests for payment, directives of the Engineer, names, addresses, and telephone numbers of all contractors, subcontractors and principal equipment and materials suppliers, and other Project-related documents. Transmitting communications on acceptance of work, requests for information to or from the Contractor, or other important information relating to project schedule, inspections, activities or work issues shall be made in writing to the Contractor with a copy to the Engineer. These written communications should include the date and time of transmittal.

22.2.20. Keep a diary or log book throughout the Construction Phase, recording the Contractor's hours, manpower and equipment on the job site, the Resident Project Representative's time on and daily activities related to the Project, weather conditions, nature and location of Work being performed each working day by each Contractor, verbal instructions and interpretations received from the Engineer and/or given to the Contractor, data relative to questions of extras or deductions, list of principal visitors with dates and times of visits, decisions reached, observations in general, specific observations in more detail as in the case of observing test procedures, instances of rejected Work and corrective action taken by the Contractor relative thereto, and other pertinent and relevant information. The Resident Project Representative should have available a digital camera to record meaningful construction progress, buried or obscured utilities, potentially faulty work or other items of work where digital photograph records would prove beneficial to documenting the construction work. These digital records should be stored on reproducible media and transmitted along with copies of each week's daily inspection reports to the Engineer and the Owner the first of the following week.

22.2.21. Observe the Contractor's record plans continually and notify the Engineer and the Contractor of any apparent failure by the Contractor to maintain an up-to-date copy of record plans at the Project site.

22.2.22. Furnish the Engineer and the Owner periodic summary reports, in addition to the daily inspection reports, of the progress of the Work and of the Contractor's compliance with the approved construction progress schedule, schedule of Shop Drawing submittals and other schedules.

22.2.23. Consult with the Engineer in advance of schedules major tests, inspections or start of important phases of the Work.

22.2.24. Review Applications for Payment with the Contractor for compliance with the procedure established by the Contract Documents for their submittal and forward them with recommendations for disposition to the Engineer, noting particularly their relation to the schedule of values, work satisfactorily completed and materials and equipment delivered to and stored at the Project site.

22.2.25. During the course of the Work, verify that guarantees, certificates, maintenance and operating manuals and other data required to be assembled and furnished by the Contractor are applicable to the items actually installed, and deliver these data to the Engineer for his review and forwarding to the Owner prior to final acceptance of the Work.

22.2.26. If a semi-final inspection is performed, transmit to the Contractor a list of observed items requiring correction.

22.2.27. Assist the Engineer in final inspection of the Work in the company of the Owner and the Contractor and preparation and transmittal to the Contractor of a final list of items to be corrected.

22.2.28. Verify that all items on the final inspection list have been corrected and make recommendations to the Engineer concerning acceptance.

22.2.29. Receive from the Contractor and prepare for transmittal to the Owner the documentation the Contractor is required to furnish at the completion of the Work.

22.3. LIMITATIONS OF AUTHORITY - Except upon written instructions and directions of the Engineer, the Resident Project Representative shall not:

22.3.1. Authorize any deviation from the Contract Documents or approve any substitute materials or equipment.

22.3.2. Assume or undertake any of the responsibilities of the Contractor, Subcontractors or the Contractor's superintendent.

22.3.3. Expedite the Work for the Contractor.

22.3.4. Advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract Documents.

22.3.5. Advise on or issue directions as to safety precautions and programs in connection with the Work.

22.3.6. Authorize or suggest that the Owner occupy the Project in whole or in part.

22.3.7. Personally conduct or participate in specialized field or laboratory tests or inspections conducted by others or require special inspection or testing.

22.3.8. Assist the Contractor in maintaining an up-to-date copy of record plans or prepare or certify to the preparation of record plans.

22.3.9. Issue a Certificate of Payment or a Certificate of Completion of the Work.

22.3.10. Order the Contractor to stop the Work or any portion thereof.

23. AIRPORT PROJECT PROCEDURES (CONSTRUCTION SAFETY PLAN)

23.1. The Contractor shall limit his work within the areas designated on the Construction Safety Plan (Sheet G101 of plans). Regardless of any other written or verbal communication issued on this Project, Safety is solely the responsibility of the Contractor.

23.2. 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.

23.3. The Contractor shall be responsible for field marking and protecting all utilities within the construction limits.

23.4. All equipment, vehicles, and materials must be stored in the designated storage or staging area or in areas acceptable to the Engineer. The Contractor's vehicles and equipment shall be marked in accordance with state and federal safety regulations.

23.5. No open flames or burning will be allowed on Airport property except as specifically authorized by the Engineer in writing.

23.6. 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 life and health of employees on the job, the safety of airport users, the safety of moving and parked vehicles and other property during the performance of the work.

23.7. Except as otherwise specified, the most current version of FAA AC 150/5370-2 and all its references shall be used in maintaining airport operational safety during construction.

23.8. The Contractor shall integrate and maintain requirements of airport operational safety into each planning and work schedule. The Contractor's Safety Officer shall continuously monitor all planning schedules and work underway for compliance to AC 150/5370-2; and 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 pre-construction conference and each coordination and progress meeting.

23.9. Except as specified directly, no measurement or payment will be made for the work in this section; it will be considered as incidental cost to Mobilization and other items of work.

24. PROJECT TIME AND LIQUIDATED DAMAGES

24.1. The work as described by the Contract documents and as shown on the plans shall be completed and ready for use by the Owner within the time shown below after the date of Notice to Proceed. The time schedule for completion of this project is critical and liquidated damages as prescribed in the Contract will be enforced.

24.2. Owner and Contractor recognize that time is of the essence and that the Owner will suffer financial loss if the work is not substantially complete in the accordance with the time specified herein. They also recognize the delays, expenses and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by the Owner if the work is not completed on time. Accordingly, instead of requiring any such proof, the Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the Owner the amounts stipulated herein.

24.3. The Contractor further understands and hereby expressly agrees that in addition to liquidated damages specified herein, to pay the Owner the actual costs to the Owner for any inspector or inspectors necessarily employed by the Owner on the work and the actual costs to the Owner for the Engineer's observation of construction and project representative services including all travel and subsistence expenses after the date specified for project completion until the work is completed and ready for final payment. Further, the Contractor agrees that the sums to be paid the Owner may be deducted from the sum due the Contractor for work performed.

Contract Time: 180 Calendar Days for Bid Schedule 1: 160'x60' Hangar OR

130 Calendar Days for Bid Schedule 2: 80'x80' Hangar

24.4. The Contractor shall complete all punch list items determined by the Owner and the Engineer within 14 consecutive calendar days from the date of Final Inspection, except for final pavement marking. Failure to do so will result in liquidated damages of $1,000 per day beyond the 14-day period.

25. PROJECT RECORD DOCUMENTS

25.1. RECORDING

25.1.1. During daily progress of the work, the job superintendent for the Contractor shall record information concurrently with construction progress. Do not conceal any work until required information is recorded.

25.1.2. All field data for record information shall be obtained by a surveyor who is a Registered Land Surveyor (RLS) in the State of North Carolina. All field notes to determine the "as-built" conditions shall be sealed by the RLS who performed the survey and shall be submitted to the Engineer.

25.1.3. Record Information includes but is not limited to the following:

25.1.3.1. Depths of various elements of foundation in relation to finish reference datum.

25.1.3.2. Horizontal and vertical locations of pavements and underground utilities and appurtenances, referenced to permanent surface improvements or finish reference datum.

25.1.3.3. Field changes of dimension and detail.

25.1.3.4. Details not on original Contract Drawings.

25.1.3.5. Changes made by field order or by Change Order.

25.1.3.6. Extent and dimensions of pavement removal.

25.1.3.7. Any other changes in the plans.

25.1.3.8. Storm Drainage and Sanitary Sewer Systems:

25.1.3.8.1. Pipes: Size, Material and invert elevations

25.1.3.8.2. Structures (manhole, junction box, headwalls, etc.):

Dimensions, invert, top and bottom elevations, and special weir walls.

25.1.3.9. Electrical, Communication, Water, Gas and other non-gravity utilities:

25.1.3.9.1. Exact distance between all manholes and points of

intersection.

25.1.3.9.2. Exact size and location of duct bank or conduit run and what circuits it applies to.

25.1.3.9.3. Rim and invert elevation of all manholes and duct banks.

25.1.3.9.4. Depth of cover on direct burial lines.

25.1.4. All horizontal control dimensions shall be to the nearest tenth of a foot. Elevations shall be to the nearest one-hundredth of a foot.

25.2. SUBMITTAL

25.2.1. At the close of the job and prior to receipt of final payment, the Contractor shall deliver to the Engineer for the Owner one complete set of Record Documents. Record drawings shall be submitted in AutoCAD and as a PDF signed and sealed by a Registered Land Surveyor (RLS) in the State of North Carolina.

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DIVISION IV

TECHNICAL SPECIFICATIONS

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ITEM C-100

CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)

DESCRIPTION

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 both the Contractor and the Engineer 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 Engineer. 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 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 Engineer 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 Engineer prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the Engineer 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 Engineer 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 Engineer 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 Engineer 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-100-1 Contractor Quality Control Program (CQCP)

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

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 Engineer 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. Use of bird attracting seed such as millet will not be allowed.

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.~~ Slope drains are not expected to be required for this project.

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 Engineer 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 Engineer 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 Engineer.

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 Engineer 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 Engineer.

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 Engineer. 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 Engineer, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The Engineer 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" and a maximum of 34" above the ground surface. Posts shall be set no more than 10’ 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" overlap and securely sealed. A trench shall be excavated approximately 4" deep by 4" 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 Engineer.

METHOD OF MEASUREMENT

102-4.1 Temporary erosion and pollution control work required will be performed as scheduled or directed by the Engineer. Items shall include all materials, installation, maintenance, removal, and restoration of the area after removal of the temporary control, as detailed on the plans. Completed and accepted work will be measured as follows:

- **a.** Installation and removal of temporary construction entrances will be measured individually. Item shall include stone, geotextile fabric, storm drainage culvert installation, maintenance, and removal of the entrance, as detailed on the plans. For maintenance, item shall include periodic inspection, repair, and replacement of materials as detailed on the plans.
- **b.** Installation and removal of compost filter sock will be measured by linear foot. Installation and removal of temporary outlets shall be included in this cost.
- **c.** Installation and removal of fiber roll check dams will be measured individually.
- **d.** Installation and maintenance of erosion control matting will be measured by square yards. Item shall include erosion control product, anchors, and incidental materials; installation, maintenance, and removal, as detailed on the plans.
- **e.** Temporary seeding will be measured per acre.
- **f.** NCDOT Rip-Rap will be measured in tons in accordance with NCDOT Technical Specification 1042 Rip Rap Materials.

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 Engineer and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-1	Temporary Construction Entrance (Installation, Maintenance, and Removal) – per each
Item C-102-2	Temporary Compost Filter Sock & Outlets (Installation, Maintenance, and Removal) – per linear foot
Item C-102-3	Temporary Fiber Roll Check Dam (Installation, Maintenance, and Removal) – per each

Item C-102-4	Erosion Control Matting (Installation and Maintenance) – per square yard
Item C-102-5	Temporary Seeding, including Seed, Lime, Fertilizer, & Mulch – per acre
Item C-102-6	NCDOT Class A Rip-Rap – per ton

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 Engineer 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

DESCRIPTION

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 as bid.

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. An Engineer/RPR field office is not required.

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-105-1 Mobilization

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)

DESCRIPTION

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:

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

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:

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

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:

$$\mathbf{Q_L = (X - L) / S_n}$$

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:

$$\mathbf{Q_L = (X - L) / S_N}$$
$$\mathbf{AND}$$
$$\mathbf{Q_U = (U - X) / S_n}$$

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:

$$\mathbf{PWL = (P_U + P_L) - 100}$$

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.

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

X = (96.60 + 97.55 + 99.30 + 98.35) / 4

X = 97.95% density

3. Calculate the standard deviation for the lot.

$S_n = \mathbf{[((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2)) / (4 - 1)]}^{1/2}$

$S_n = \mathbf{[(1.82 + 0.16 + 1.82 + 0.16) / 3]}^{1/2}$

$S_n = 1.15$

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.

$X = (x_1 + x_2 + x_3 . . . n) / n$

X = (5.00 + 3.74 + 2.30 + 3.25) / 4

X = 3.57%

3. Calculate the standard deviation S_n for the lot.

$S_n = \mathbf{[((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]}^{1/2}$

$S_n = \mathbf{[(2.04 + 0.03 + 1.62 + 0.10) / 3]}^{1/2}$

$S_n = 1.12$

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

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
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

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
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 P-101

DEMOLITION PAVEMENTS, STRUCTURES, PIPE

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 All equipment and materials shall be specified here and in the following paragraphs or approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

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. This work does not apply to this project.

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. The removed material shall be disposed of off the airport, unless otherwise specified

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 Engineer. 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 (25 mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks greater than 1/4 inch (6 mm) 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 (3 mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide (38 mm)), 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 (+0 to -3 mm) 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. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new overlay or 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 Engineer in the field during construction.

High-pressure water, cold milling, and/or rotary grinding may be used. If any 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 Engineer 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 Engineer.

Removal of foreign substances shall not proceed until approved by the Engineer. 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. Not applicable to this project.

b. Asphalt pavement repair. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the Engineer. 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 Cold 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 off Airport property unless specified otherwise on the plans. 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. 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 Contractor shall layout the area to be milled with a straightedge in increments of 1-foot widths in accordance with the construction plans. 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.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7'-0" 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.

c. 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 off Airport property unless specified otherwise on the plans.

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 Engineer. 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. Not applicable to this project.

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. Clean joints by sandblasting, or other method approved by the Engineer, on each joint face with nozzle held at an angle and not more than 3" from face. Following sandblasting, clean joints with air free of oil and water. 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. Not applicable to this project.

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 or random crack saw by removing a minimum of 1/16 inch (2 mm) 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 or random crack saw. Following routing or sawing 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-101-3.2.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. **Removal of Existing Pipe Material.** Not applicable for this project.
b. **Removal of Inlets/Manholes.** Not applicable for this project.

METHOD OF MEASUREMENT

101-4.1 Cold milling. The unit of measure for cold milling shall be 2” of milling per square yard. The location and average depth of the cold milling shall be as shown on the plans. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling.

101-4.2 Removal of Fencing. The unit of measurement for removal of existing fencing shall be per linear feet.

101-4.3 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. Pavement removal is not anticipated with this project.

101-4.4 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot of joint.

101-4.5 Removal of Foreign Substances/contaminates. The unit of measurement for foreign Substances/contaminates removal shall be the square yard.

101-4.6 Spalled and failed asphalt pavement repair. Not applicable for this project.

101-4.7 Concrete Spall Repair. Not applicable for this project.

101-4.8 Removal of Pipe and other Buried Structures. This work is not anticipated for this project.

101-4.9 Removal of Existing Rip-Rap. The unit of measurement for existing rip-rap removal shall be the number of square yards removed by the Contractor. The Contractor shall remove this existing material and dispose of it off Airport property in a safe and legal manner.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at 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.

Item P 101-1	Asphalt Cold Milling (Varying Depth) – per square yard
Item P-101-2	Remove Existing Perimeter Fence, 6’ High Chain-Link – per linear feet
Item P-101-3	Remove Existing Rip-Rap – 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.

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.

The construction areas have been surveyed by the Owner to facilitate the determination of the quantities of excavation and embankment for this project. The Contractor shall have the option to accept the Owner's surveyed elevations, measurements, and quantities in the bid form, or provide surveyed elevations and measurements for determination of actual quantities to be accepted and approved by the Owner. Should the Contractor choose not to accept the Owner's surveyed elevations, measurements and quantities, he shall so notify the Engineer in writing prior to commencing earthwork activities. The Owner and Engineer shall agree on the licensed professional land surveyor (PLS) to be used and the survey parameters to include the spacing of cross sectional elevations and measurements. Surveyed cross sectional elevations and measurements of existing ground provided by the Contractor shall be performed prior to beginning of work under this contract, shall be monitored by the Engineer, shall be performed by personnel qualified to perform this type of work, and shall be at the Contractor's expense with no additional cost to the Owner. Likewise, surveyed cross sectional elevations and measurements of finished ground provided by the Contractor shall be performed immediately after satisfactory completion of work under this contract, shall be monitored by the Engineer, shall be performed by personnel qualified to perform this type of work, and shall be at the Contractor's expense with no additional cost to the Owner.

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 otherwise classified and paid for under one of the following items.

b. Rock excavation. Not applicable to this project.

c. Muck excavation. Not applicable to this project.

d. Drainage excavation. Not applicable to this project.

e. Borrow excavation. Not applicable to this project.

f. Embankment in Place. Embankment in place shall consist of the excavation, hauling, placing in layers, mechanical and/or chemical drying, compacting, watering, mixing, sloping and other necessary operations for construction of embankments, regardless of its nature, which is not otherwise classified and paid for under the following items.

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed of off airport property or in designated waste areas, if 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 Engineer.

CONSTRUCTION METHODS

152-2.1 General. Although not anticipated, if required, before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed as required in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of off of airport property. Waste areas, if approved by the Engineer and only if/where shown on the plans, 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 Engineer.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the Engineer notified per Section 70, paragraph 70-20. At the direction of the Engineer, 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", 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.

There shall be no separate payment for work associated with returning areas impacted by the Contractor's staging or hauling operations. All work associated with restoring the haul route/staging areas to pre-construction conditions, including seed/mulch, shall be considered incidental to the project.

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 Engineer, 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 Engineer has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and Engineer 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.

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 Engineer 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 Engineer. 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 off of Airport property.

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

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 Engineer. 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 Engineer 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 so that it can be measured for payment. 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 Engineer. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard for unsuitable excavation. 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.

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 Engineer. All over-break shall be graded or removed by the Contractor and disposed of as directed by the Engineer. The Engineer 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 Engineer 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 someone other than the Contractor; for example, the utility unless shown otherwise 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 Engineer. 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. Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the Engineer. All unsuitable material shall be disposed of by the Contractor off of airport property. 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. Borrow areas shall not create a hazardous wildlife attractant.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the borrow sources, subject to the approval of the Engineer. The Contractor shall notify the Engineer at least 15 days prior to beginning the excavation so necessary tests for suitability can be made. All unsuitable material shall be disposed of by the Contractor. Borrow areas shall be excavated to regular lines to permit accurate measurements.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating for drainage ditches such as intercepting, inlet, or outlet ditches; for temporary levee construction; or for any other type as designed or types as shown on the plans. The work shall be performed in sequence with the other construction. Intercepting 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 Engineer. 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. In the areas of pavement and building construction where an embankment is to be constructed to a height of 4 feet or less, 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" and shall then be compacted per paragraph 152-2.10. When the height of fill is greater than 4 feet, sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

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" 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 Engineer, 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 8 inches upon the Contractor’s demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The Engineer 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 Engineer. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the Engineer.

152-2.8 Formation of embankments. Unless specified otherwise on the plans, the material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 8 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 Engineer. 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 Engineer 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 D1557. A new Proctor shall be developed for each soil type based on visual classification.

Quality assurance density tests will be taken by the Owner's representative for every 1,000 square yards of compacted embankment for each lift which is required to be compacted, with a minimum of one test per lift, or other appropriate frequencies as determined by the Engineer.

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:

- Non-cohesive Soils: A depth of 16-inches from the top of subgrade and to a density of not less than 100% percent of the maximum density as determined by ASTM D1557.
- Cohesive Soils: A depth of 14-inches from the top of subgrade and to a density of not less than 95% percent 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-90**1**.

The in-place field density shall be determined in accordance with 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 Engineer's presence and provide the test results upon completion to the Engineer for acceptance. If the specified density is not attained, the area represented by the test or as designated by the Engineer 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.

Unless specified otherwise on the plans, when rock and other embankment material are excavated at approximately the same time as the subgrade, the rock shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones or fragmentary rock larger than 4" in their greatest dimensions will not be allowed in the top 6inches of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the Engineer and the finer material shall be used to fill the voids forming a dense, compact mass. Rock or boulders shall not be disposed of except at places and in the manner designated on the plans or by the Engineer.

For lifts located lower than 4 vertical feet below finish grade and 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 by the Engineer, in lifts not exceeding 2 feet in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. A lift of 2 feet in thickness shall not be constructed above an elevation 4'-0" below the finished subgrade. For lifts within the top 4 vertical feet of an embankment, or below a finished subgrade, the Contractor shall be responsible for crushing, pulverizing and further breaking down pieces, such that the material may be placed in the embankment as directed in lifts not exceeding 8 inches in thickness, except for the top 12 inches where particle size is limited to 4" in their greatest dimension.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, disking, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items. Payment for compacted embankment will be made under embankment in-place and no payment will be made 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 100 psi in the presence of the Engineer. Apply a minimum of **one coverage**, or as specified by the Engineer, 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.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth and density as specified in Section 152-2.8. 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% 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. Tests for moisture content and compaction will be taken at a minimum of 1,000 S.Y. of subgrade. Contractor shall be responsible for their own Quality Control testing. All quality assurance acceptance testing shall be done by the Owner's representative and coordinated through the Engineer.

The in-place field density shall be determined in accordance with 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.

The finished grading operations, conforming to the typical cross-section, shall be completed and maintained at least 1,000-t ahead of the paving operations, or as directed by the Engineer.

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 loose or protruding rocks on the back slopes of cuts shall be pried loose or otherwise removed to the slope finished grade line. All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the Engineer 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. After the subgrade is substantially complete, the Contractor shall remove any soft or other unstable material over the full width of the subgrade that will not compact properly. All low areas, holes or depressions in the subgrade shall be brought to grade with suitable select material. 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 Engineer.

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 Engineer. The Contractor shall perform all final smoothness and grade checks in the presence of the Engineer. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that it 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. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, reshaping and recompacting.

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, intermediate and other designated areas, the surface shall be of such smoothness that within the grading limits where no subbase or base is to placed, the constructed grade shall not vary more than 0.10 feet from specified design 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 Engineer, 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.No direct payment will be made for topsoil under Item P-152. The quantity removed and placed directly or stockpiled shall be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

When stockpiling of topsoil and later rehandling of such material is directed by the Engineer, the material so rehandled shall be paid for at the contract unit price per cubic yard for "topsoiling," as provided in Item T-905.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard 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 Engineer. After completion of all excavation and embankment operations and prior to the placing of base or subbase material, the final excavation and embankment shall be verified by the Contractor by means of field cross-sections taken randomly at station intervals not exceeding 50 linear feet.

152-3.2 The quantity of unclassified excavation to be paid for shall be the number of cubic yards 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 The quantity of embankment in place shall be the number of cubic yards measured in its final position.

BASIS OF PAYMENT

152-4.1 "Unclassified Excavation" payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for excavation, preparation of subgrade in excavations, placement of excavated material in embankments or stockpile areas, and for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2 "Undercut Excavation, Replace with Backfill" payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for undercut excavation, furnishing, placement, and compaction of acceptable backfill material, and for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.3 For "Embankment in Place", payment shall be made at the contract unit price per cubic yard. 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-152-1	Unclassified Excavation – per cubic yard
Item P-152-2	Undercut Excavation, Replace with Backfill – per cubic yard
Item P-152-3	Embankment in Place – 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 (10-lb) Rammer and a (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)
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)

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

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

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 and 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 or 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 100% 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
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 % by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch	100		0
1-1/2 inch	95-100		±5
1 inch	70-95		±8
3/4 inch	55-85		±8
No. 4	30-60		±8
No. 40[2]	10-30		±5
No. 200[2]	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 sieve shall not exceed two-thirds the fraction passing the No 40 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 Engineer 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 Engineer.

209-2.4 Separation Geotextile. Not used.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the Engineer, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. 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 Engineer 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 Engineer. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved by the Engineer.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the Engineer 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 Engineer 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 Engineer, 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 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 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 (4°C) 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", reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the Engineer. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. 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" when tested with a 12'-0" 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'-0" straightedge for the full length of each line on a 50'-0" grid.

b. Grade. The grade and crown shall be measured on a 50'-0" grid and shall be within +0 and -1/2" 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 1,200 square yds (1,000 m^2). 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 Engineer's presence and provide the test results upon completion to the Engineer 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. Depth tests shall be made by test holes at least 3 inches in diameter that extend through the base. The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the Engineer for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be

blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of cubic yards of material actually constructed and accepted by the Engineer 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 Engineer 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 cubic 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-209-1	Crushed Aggregate Base Course (6” Thickness) – 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 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-401

ASPHALT MIX PAVEMENT

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

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

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% 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
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds: Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1[2]	ASTM D4791

Bulk density of slag[3]	Weigh not less than 70 pounds per cubic foot	ASTM C29.

[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).

[3] Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	0% to 15% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 70-22.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	75% minimum	ASTM D6084[1]

[1] Follow procedure B on RTFO aged binder.

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the Engineer for review and accepted in writing. The Engineer's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition**.** Samples shall be prepared and compacted using the gyratory compactor in accordance with ASTM D6925.

Should a change in sources of materials be made, a new JMF must be submitted to the Engineer for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the Engineer and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the Engineer, will be borne by the Contractor.

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

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.

- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of gyrations.
- Laboratory mixing and compaction temperatures.
- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated, or which are from a prior construction season shall not be accepted.
- The JMF shall state that the percentage of reclaimed asphalt shingles (RAS), post-consumer reclaimed asphalt shingles (PRAS), and manufacturer-waste reclaimed asphalt shingles (MRAS) is equal to zero (0) percent.
- The JMF shall state that the percentage of crushed glass is equal to zero (0) percent.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR)[1]	not less than 80 at a saturation of 70-80%	ASTM D4867

Asphalt Pavement Analyzer (APA)[2]	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

[1] Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

[2] AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve
1 inch	--
3/4 inch	100
1/2 inch	90-100
3/8 inch	72-88
No. 4	53-73
No. 8	38-60
No. 16	26-48
No. 30	18-38
No. 50	11-27
No. 100	6-18
No. 200	3-6
Minimum Voids in Mineral Aggregate (VMA)[1]	15.0
Asphalt Percent:	
Stone or gravel	5.0-7.5
Slag	6.5-9.5
Recommended Minimum Construction Lift Thickness	2 inch

[1] To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

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

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. A control strip is not required.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches or greater	40[1]	4
Greater than 2 inches but less than 3 inches	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The Engineer, or Engineer's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the Engineer determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

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

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles are not required.

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

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

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

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

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

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

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A prime coat in accordance with Item P-602 shall be applied to aggregate base prior to placing the asphalt mixture.

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

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

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

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

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

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope unless shown otherwise on the laydown plan as accepted by the Engineer. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of **12 feet** except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

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

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

Areas of segregation in the surface course, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when

the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

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

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

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

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.
Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P- 603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the Engineer prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

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

deficiencies are satisfactorily corrected.

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

Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

a. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

b. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

c. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

d. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

e. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

f. Smoothness for Contractor Quality Control. The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria are not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot “straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot straightedge approved by the Engineer. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

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

(1) Transverse measurements. Transverse measurements shall be taken for each day’s production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet or more often as determined by the Engineer. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 ft or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401- 6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P- 608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

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

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

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

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

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ½ inch and replacing with new material. Skin patching is not allowed.

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

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

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

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch	±6%	±9%
1/2 inch	±6%	±9%
3/8 inch	±6%	±9%
No. 4	±6%	±9%
No. 16	±5%	±7.5%
No. 50	±3%	±4.5%
No. 200	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

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

Control Chart Limits Based on Range

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

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

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

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Engineer at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day. For small projects, with multiple small placements, or if the total project size is less than 3,000 tons, acceptable material will be paid for by the ton (metric ton) placed per day.

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

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of three compacted specimens prepared in accordance with ASTM D6925.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the Engineer.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the Engineer to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the Engineer.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the Engineer for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his

expense, may take additional cores as approved by the Engineer to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the Engineer in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot that has a longitudinal joint. Core locations will be determined by the Engineer in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, and grade**.**

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch vertically or 0.1 feet laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot longitudinal spacing and at all longitudinal grade breaks. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline, and edge of taxiway/taxilane pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. Not used

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	**U**
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	92.0	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.30; Base Course Mat Density (%), 1.55; Joint Density (%), 1.55.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94.5% with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 94.0% with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 92.5% with 1.55% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the Engineer. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

401-6.5 Leveling course. Not applicable for this project.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed **100 percent** of the product of the contract unit price and the total number of tons of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the sublot shall be reduced by 5%.

Table 6. Price adjustment schedule[1]

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject [2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

[2] The lot shall be removed and replaced. However, the Engineer may decide to allow the rejected lot to remain. In that case, if the Engineer and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. Not applicable to this project.

401-8.1 Payment. Payment will be made under:

Item P-401-1	Asphalt Surface Course – 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 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 C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6995	Standard Test Method for Determining Field VMA based on the

	Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

FAA Orders

5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards

Software

FAARFIELD

END OF ITEM P-401

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 Engineer 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 Engineer.

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 Engineer.

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 Engineer 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 Engineer. 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 Resident Project Representative (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-602-1	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 Engineer 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.

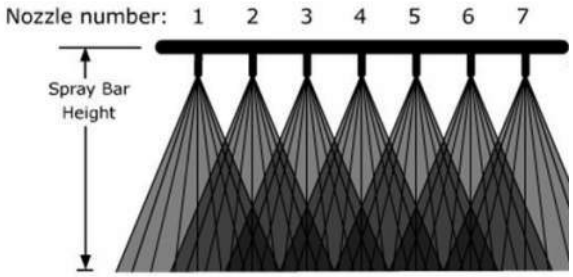
CONSTRUCTION METHODS

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 (10°C) or above; 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 Engineer.

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 (13 km per hour) or seven (700) feet per minute (213 m 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.

A correct triple overlap spray pattern is when, except for the nozzles on the outside end of the spray bar, each point on the pavement surface receives a uniform coating of tack by exactly three spray nozzles, as depicted in the image below.



The distributor truck shall be equipped with a minimum 12-foot (3.7-m) 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 Engineer.

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 Engineer prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	0.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

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 Engineer. 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 Resident Project Representative (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 (16°C) 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-603-1	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

ITEM P-605

JOINT SEALANTS FOR CONCRETE 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 and cracks in rigid pavements.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ASTM D5893 Standard Specifications for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

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 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 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 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, 15 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 or for refacing joints or cleaning sawed joints where sandblasting does not provide a clean joint.

c. Sandblasting equipment. Is not allowed.

d. Waterblasting equipment. Include with the waterblasting equipment a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water resupply equipment. Provide water tank and auxiliary resupply equipment of sufficient capacity to permit continuous operations. The nozzle shall have an adjustable guide that will hold the nozzle aligned with the joint approximately 1" above the pavement surface. Adjust the height, angle of inclination and the size of the nozzle as necessary to obtain satisfactory results. A pressure gauge mounted at the pump shall show at all times the pressure in psi at which the equipment is operating.

e. 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.

f. Two-component, cold-applied, machine mix sealing equipment. Provide equipment used for proportioning, mixing, and installing Federal Specification SS-S-200 Type M joint sealants designed to deliver two semifluid components through hoses to a portable mixer at a preset ratio of one (1) to one (1) by volume using pumps with an accuracy of ±5% for the quantity of each component. The reservoir for each component shall be equipped with mechanical agitation devices that will maintain the components in a uniform condition without entrapping air. Incorporate provisions to permit thermostatically controlled indirect heating of the components, when required. However, immediately prior to proportioning and mixing, the temperature of either component shall not exceed 90°F. Provide screens near the top of each reservoir to remove any foreign particles or partially polymerized material that could clog fluid lines or otherwise cause misproportioning or improper mixing of the two components. Provide equipment capable of thoroughly mixing the two components through a range of application rates of 10 to 60 gallons per hour and through a range of application pressures from 50 psi to 1500 psi as required by material, climatic, or operating conditions. Design the mixer for the easy removal of the supply lines for cleaning and proportioning of the components. The mixing head shall accommodate nozzles of different types and sizes as may be required by various operations. The dimensions of the nozzle shall be such that the nozzle tip 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.

g. Two-component, cold-applied, hand-mix sealing equipment. Mixing equipment for Federal Specification SS-S-200 Type H sealants shall consist of a slow-speed electric drill or air-driven mixer with a stirrer in accordance with the manufacturer's recommendations. Submit printed copies of manufacturer's recommendations 15 days prior to use on the project where installation procedures, or any part thereof, are required to be in accordance with those recommendations. Installation of the material will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

h. 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 Engineer, 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 one of the approved methods as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch 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 from it.~~ After 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-breaker separating tape 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 Engineer before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch ±1/16 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 Engineer. 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 included in, and paid for, under the "Hangar Building, Complete" item of work.

BASIS OF PAYMENT

605-5.1 All work in this specification section shall be included in, and paid for, under the "Hangar Building, Complete" item of work. Payment will be on a lump sum basis and 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.

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 D5893	Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

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, at the locations and of the form and dimensions shown on the plans. This specification shall be used for all concrete, including signage bases, 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 Engineer 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 Engineer. 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	467 or 4 and 67
1 inch	57
¾ inch	67
½ inch	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 of ASTM C150 Type I and II, low alkali cements.

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 Engineer.

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 Engineer 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 Engineer 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 Engineer. 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.

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 be in accordance with the plans conforming to the requirements below**.**

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 one of the following requirements.

Materials for Curing

Waterproof paper	**ASTM C171**
Clear or white Polyethylene Sheeting	**ASTM C171**
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 Engineer.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of **4,500 psi in 28 days for hangar slabs and aprons** 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 Engineer's 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 Engineer. 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 Engineer. 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. Where bars meeting ASTM A775 or A934 are used, the vibrators shall be equipped with rubber or non-metallic vibrator heads. Furnish a spare, working, vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4" in depth with high frequency mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4" or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate internal vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6,000 cycles per minute when submerged. Do not use vibrators to transport the concrete in the forms. Penetrate the previously placed lift with the vibrator when more than one lift is required. Use external vibrators on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete. Vibrators shall be manipulated to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The vibration at any point shall be of sufficient duration to accomplish compaction but shall not be prolonged to where segregation occurs. Concrete deposited under water shall be carefully placed in a compact mass in its final position by means of a tremie or other approved method and shall not be disturbed after placement.

610-3.10 Construction Joints. Joints shall be constructed as indicated on the plans. If the placement of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, provisions shall be made for grooves, steps, reinforcing bars or other devices as specified. The work shall be arranged so that a section begun on any day shall be finished during daylight of the same day. Before depositing new concrete on or against concrete that has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly, wetted, and covered with a neat coating of cement paste or grout.

610-3.11 Expansion joints. Expansion joints shall be constructed at such points and dimensions as indicated on the drawings. The premolded filler shall be cut to the same shape as the surfaces being joined. The filler shall be fixed firmly against the surface of the concrete already in place so that it will not be displaced when concrete is deposited against it.

610-3.12 Defective work. Any defective work discovered after the forms have been removed, which in the opinion of the Engineer cannot be repaired satisfactorily, shall be immediately removed and replaced at the expense of the Contractor. Defective work shall include deficient dimensions, or bulged, uneven, or honeycomb on the surface of the concrete.

610-3.13 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. Mortar finishing shall not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.

The surface finish of exposed concrete shall be a rubbed finish. If forms can be removed while the concrete is still green, the surface shall be wetted and then rubbed with a wooden float until all irregularities are removed. If the concrete has hardened before being rubbed, a carborundum stone shall be used to finish the surface. When approved, the finishing can be done with a finishing machine.

610-3.14 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. The concrete shall be protected from the weather, flowing water, and from defacement of any nature during the project. The concrete shall be cured by covering with an approved material as soon as it has sufficiently hardened. Water-absorptive coverings shall be thoroughly saturated when placed and kept saturated for at least three (3) days following concrete placement. All curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to air currents. Wooden forms shall be kept wet at all times until removed to prevent opening of joints and drying out of the concrete. Traffic shall not be allowed on concrete surfaces for seven (7) days after the concrete has been placed.

610-3.15 Drains or ducts. Drainage pipes, conduits, and ducts that are to be encased in concrete shall be installed by the Contractor before the concrete is placed. The pipe shall be held rigidly so that it will not be displaced or moved during the placing of the concrete.

610-3.16 Cold weather placing. When concrete is placed at temperatures below 40°F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing. The aggregates, or water, or both, shall be heated to place the concrete at temperatures between 50°F and 100°F.

Calcium chloride may be incorporated in the mixing water when directed by the Engineer. Not more than pounds of Type 1 nor more than 1.6 pounds of Type 2 shall be added per bag of cement. After the concrete has been placed, the Contractor shall provide sufficient protection such as cover, canvas, framework, heating apparatus, etc., to enclose and protect the structure and maintain the temperature of the mix at not less than 50°F until at least 60% of the designed strength has been attained.

610-3.17 Hot weather placing. When concrete is placed in hot weather greater than 85ºF, 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 Engineer 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 QA 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 Engineer, 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 All work in this specification section shall be included in, and paid for, under the "Hangar Building, Complete" item of work. Payment will be on a lump sum basis and 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.

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 Engineer. 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. 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 Engineer prior to the initial application of markings. The reports can be used for material acceptance or the Engineer and/or 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 I or II	Yellow	33538 or 33655	115 ft^2/gal	Type III	10 lb/gal
Temporary Marking Waterborne Type I or II	Yellow	33538 or 33655	230 ft^2/gal	No beads	N/A

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2c

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595

b. **Waterborne**. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I. 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.

c. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D, Type III.

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.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature is at least 45°F and rising and the pavement surface temperature is at least 5°F above the dew point or when conditions 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. The area to be painted shall be cleaned by waterblasting, shotblasting, grinding, sandblasting, or by other methods as required to remove all contaminants without damage to the pavement surface. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer. 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 Engineer 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 Engineer 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 Engineer. 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 manufacturer's application and surface preparation requirements must be submitted to the Engineer 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 Engineer.

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 or less	±1/2 inch
greater than 36 inch to 6 feet	±1 inch
greater than 6 feet to 60 feet	±2 inch
greater than 60 feet	±3 inch

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. Not required for this project. ~~Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the Engineer. 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. Not required for this project.

620-3.9 Temporary Marking. If the airport operations require pavement marking prior to the recommended waiting period, the paint may be applied in a temporary light coat application. Appropriate modifications to paragraph 3.5 should be included to specify a 30% to 50% application rate for temporary markings. Glass beads are not required for temporary markings. Glass beads will not adhere well at the low application rates for temporary markings and require immediate sweeping and cleanup before aircraft are allowed to use the pavement.

The final marking application must be at full strength in order to adequately set the glass beads.

620-3.10 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 Engineer. 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 temporary markings to be paid for shall be the number of square feet of painting performed in accordance with the specifications. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

620-4.1b The quantity of taxiway markings to be paid for shall be measured by the number of square feet for each type of marking specified. Taxiway marking includes surface preparation, application of paint and application of glass beads if specified.

BASIS OF PAYMENT

620-5.1a 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.

620-5.1b Payment shall be made at the respective contract price per square foot for taxiway painting to include reflective media. 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 in accordance with these specifications.

Payment will be made under:

Item P-620-1	Pavement Markings, Temporary, Yellow (No Beads) – per square foot
Item P-620-2	Pavement Markings, Permanent, Yellow, Reflective (Type III Beads), include Microbicide – 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

ITEM F-162

CHAIN-LINK FENCE

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence in accordance with these specifications, the details shown on the plans, and in conformity with the lines and grades shown on the plans or established by the Engineer.

MATERIALS

162-2.1 Fabric. The fabric shall be woven with a 9-gauge galvanized steel wire in a 2-inch mesh and shall meet the requirements of ASTM A392, Class 2.

162-2.2 Barbed wire. Barbed wire shall be 2-strand 12-1/2 gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A121, Class 3, Chain Link Fence Grade.

162-2.3 Posts, rails, and braces. Line posts, rails, and braces shall conform to the requirements of ASTM F1043 or ASTM F1083 as follows:

- Galvanized tubular steel pipe shall conform to the requirements of Group IA, (Schedule 40) coatings conforming to Type A, or Group IC (High Strength Pipe), External coating Type B, and internal coating Type B or D.

Posts, rails, and braces, with the exception of galvanized steel conforming to ASTM F1043 or ASTM F1083, Group 1A, Type A, or aluminum alloy, shall demonstrate the ability to withstand testing in salt spray in accordance with ASTM B117 as follows:

- External: 1,000 hours with a maximum of 5% red rust.
- Internal: 650 hours with a maximum of 5% red rust.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Federal Specification RR-F-191/3.

162-2.4 Gates. Gate frames shall consist of galvanized steel pipe and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

162-2.5 Wire ties and tension wires. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A824.

All material shall conform to Federal Specification RR-F-191/4.

162-2.6 Miscellaneous fittings and hardware. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A153. Barbed wire support arms shall withstand a load of 250 pounds applied vertically to the outermost end of the arm.

162-2.7 Concrete. Concrete shall have a minimum 28-day compressive strength of 3000 psi

162-2.8 Marking. Each roll of fabric shall carry a tag showing the kind of base metal, kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal and kind of coating.

CONSTRUCTION METHODS

162-3.1 General. The fence shall be constructed in accordance with the details on the plans and as specified here using new materials. All work shall be performed in a workmanlike manner satisfactory to the Engineer. The Contractor shall lay out the fence line based on the plans. Fence location shall be verified by the Owner before fence construction begins. The Contractor shall span the opening below the fence with barbed wire at all locations where it is not practical to conform the fence to the general contour of the ground surface because of natural or manmade features such as drainage ditches. The new fence shall be permanently tied to the terminals of existing fences as shown on the plans. The Contractor shall stake down the woven wire fence at several points between posts as shown on the plans.

The Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet. The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence.

162-3.2 Clearing fence line. Clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions that will interfere with proper construction of the fence. Stumps within the cleared area of the fence shall be grubbed or excavated. The bottom of the fence shall be placed a uniform distance above ground, as specified in the plans. When shown on the plans or as directed by the Engineer, the existing fences which interfere with the new fence location shall be removed by the Contractor as a part of the construction work unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other suitable material and compacted with tampers.

The cost of removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.

162-3.3 Installing posts. All posts shall be set in concrete at the required dimension and depth and at the spacing shown on the plans.

Posts should be spaced not more than 10 feet apart and should be set a minimum of 36 inches in concrete footings. If the frost depth is greater than 36 inches, the posts should be set accordingly. The posts holes shall be in proper alignment so that there is a minimum of 3 inches of concrete on all sides of the posts. The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within seven (7) days after the individual post footing is completed**.**

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches. After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

162-3.4 Installing top rails. The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.

162-3.5 Installing braces. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

162-3.6 Installing fabric. The wire fabric shall be firmly attached to the posts and braced as shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than one inch or more than 4 inches from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches or less.

162-3.7 Electrical grounds. Electrical grounds shall be constructed where a power line passes over the fence and at 500 feet intervals. The ground shall be installed directly below the point of crossing. The ground shall be accomplished with a copper clad rod 8 feet long and a minimum of 5/8 inches in diameter driven vertically until the top is 6 inches below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods and conductor shall not constitute a pay item and shall be considered incidental to fence construction. The Contractor shall comply with FAA-STD-019, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment, paragraph 4.2.3.8, Lightning Protection for Fences and Gates, when fencing is adjacent to FAA facilities.

162-3.8 Cleaning up. The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction. All disturbed areas shall be seeded per T-901.

METHOD OF MEASUREMENT

162-4.1 Gates will be measured as complete units.

162-4.2 Chain-link fence will be measured for payment by the linear foot. Measurement will be along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

BASIS OF PAYMENT

162-5.1 Payment for vehicle or pedestrian gates will be made at the contract unit price for each gate.

162-5.2 Payment for chain-link fence will be made at the contract unit price per linear foot

The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item F-162-1 Vehicle Gate – 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 A121	Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A392	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A824	Standard Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link FenceASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM F1043	Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083	Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

Federal Specifications (FED SPEC)

FED SPEC RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
FED SPEC RR-F-191/4	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

FAA Standard

FAA-STD-019	Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment
FAA Orders	5300.38AIP Handbook

END OF ITEM F-162

ITEM T-901
SEEDING

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding the areas shown on the plans or as directed by the Engineer 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 Engineer 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 noted on the plans.

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 mesh sieve and 50% will pass through a No. 100 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 1,000 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 commercial fertilizer and shall be spread at the rate of 1,000 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 Engineer 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 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 as a result of grading operations and, if immediately prior to seeding, the top 3 inches 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. Clods shall be broken and the top 3 inches 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 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 of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot 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 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 per minute at a pressure of 100 lb / sq inches 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. 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 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 of lime shall be added to and mixed with each 100 gallons of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons 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 Engineer all sources of water at least two (2) weeks prior to use. The Engineer 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 Engineer 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, 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 Engineer, 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 Engineer. 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 Engineer. A grass stand shall be considered adequate when bare spots are one square foot 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 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 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-901-1	Permanent Seeding, including Seed, Lime, Fertilizer, & Mulch – 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

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) 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 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 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 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 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 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 Topsoil obtained on the site shall be measured by the number of cubic yards of topsoil measured in its original position and stripped or excavated. Topsoil stockpiled by others and removed for topsoil by the Contractor shall be measured by the number of cubic yards of topsoil measured in the stockpile. Topsoil shall be measured by volume in cubic yards computed by the method of end areas.

905-4.2 Topsoil obtained off the site shall be measured by the number of cubic yards of topsoil measured in its original position and stripped or excavated. Topsoil shall be measured by volume in cubic yards computed by the method of end areas.

BASIS OF PAYMENT

905-5.1 Payment will be made at the contract unit price per cubic yard for topsoil (obtained on the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

905-5.2 Payment will be made at the contract unit price per cubic yard for topsoil (obtained off the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-905-1	Topsoil, 4" Depth (Furnished from On site) – per cubic yard
Item T-905-2	Topsoil, 4" Depth (Furnished from Off Site) – 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

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 Engineer.

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.

a. **Hay.** Hay shall be native hay in an air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile, containing no fertile seed.

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.

c. Hay mulch containing seed. Hay mulch shall be mature hay containing viable seed of native grasses or other desirable species stated in the special provisions or as approved by the Engineer. The hay shall be cut and handled so as to preserve the maximum quantity of viable seed. Hay mulch that cannot be hauled and spread immediately after cutting shall be placed in weather-resistant stacks or baled and stored in a dry location until used.

d. **Manufactured mulch.** Cellulose-fiber or wood-pulp mulch shall be products commercially available for use in spray applications.

~~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 Engineer 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 Engineer 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 Engineer. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre to provide a loose depth of not less than 1-1/2 inches nor more than 3 inches. Other organic

material shall be spread at the rate directed by the Engineer. 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 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 nor more than 2 inches.

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 Engineer. 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 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 Engineer, 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 Engineer, 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 per 1,000 square feet, or as directed by the Engineer, with a minimum of 6 gallons and a maximum of 10 gallons per 1,000 square feet 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 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 per 1,000 square feet or as directed by the Engineer, with a minimum of 6 gallons and a maximum of 10 gallons per 1,000 square feet depending on the type of mulch and the effectiveness of the binder securing it.

METHOD OF MEASUREMENT

908-4.1 There shall be no separate measurement and payment for work performed under this section of the specifications. All work performed shall be considered incidental to *T-901Seeding*.

BASIS OF PAYMENT

908-5.1 There shall be no separate measurement and payment for work performed under this section of the specifications. All work performed shall be considered incidental to *T-901 Seeding*.

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

SECTION 876
RIP RAP

876-1 DESCRIPTION

Supply and place rip rap and, if necessary, filtration geotextiles in accordance with the contract and as directed by the Engineer.

876-2 MATERIALS

Refer to Division 10.

Item	Section
Geotextile for Drainage, Type 2	1056
Plain Rip Rap	1042

Provide Type 2 geotextile for filtration geotextiles and plain rip rap classes in accordance with the contract.

876-3 PLAIN RIP RAP

Grade locations for rip rap as shown in the plans. Use filtration geotextiles under rip rap when shown in the plans and as directed by the Engineer. Do not leave geotextiles exposed for more than 7 days before covering with rip rap. Place filtration geotextiles on surfaces free of obstructions, debris and soft pockets.

Overlap adjacent geotextiles at least 18 inches in the downhill and downstream direction to prevent flow from lifting the edge of the top geotextile. Pull filtration geotextiles taut so they are in tension and free of kinks, folds, wrinkles or creases. Hold geotextiles in place as needed with wire staples or anchor pins. Do not displace or damage filtration geotextiles while placing rip rap. Replace any damaged geotextiles to the satisfaction of the Engineer.

For rip rap at pipe outlets, place rip rap immediately after installing pipes. When rip rap is required for channel changes and drainage ditches, place rip rap before diverting water into channels and ditches.

Place rip rap such that the smaller stones are uniformly distributed throughout rip rap. Install rip rap with mechanical methods and if necessary, by hand to form a well-graded, dense and neat layer of rip rap.

876-4 MEASUREMENT AND PAYMENT

Rip Rap, Class ____ will be measured and paid in tons. Plain rip rap will be measured by weighing rip rap in trucks in accordance with Article 106-7.

Geotextile for Drainage will be measured and paid in square yards. Filtration geotextiles will be measured along the ground surface as the square yards of exposed geotextiles before placing rip rap. No measurement will be made for overlapping geotextiles.

The contract unit prices for *Rip Rap, Class* ____ and *Geotextile for Drainage* will be full compensation for providing, transporting and placing rip rap, filtration geotextiles, wire staples and anchor pins.

Payment will be made under:

Pay Item	Pay Unit
Rip Rap, Class ____	Ton
Geotextile for Drainage	Square Yard

1040-9 MORTAR

Proportion mortar used in all brick and block masonry by volume as shown below. Do not add any more water than is necessary to make a workable mixture.

Mix No. 1: 1 part Portland cement
1/4 part hydrated lime
3 3/4 parts mortar sand (maximum)

Mix No. 2: 1 part Portland cement
1 part masonry cement
6 parts mortar sand (maximum)

Apply Articles 1040-5, 1040-6, 1040-7 and 1040-8 to all cement, hydrated lime, mortar sand and water.

For the hydrated lime and cement portion of Mix No. 1, the Contractor may substitute Type M or Type S masonry cement that meets ASTM C270 for Type S masonry cement the minimum compressive strength of the test specimens shall be 2,500 psi at 28 days and the test specimens shall be composed of one part Type S masonry cement and 3 parts sand. Furnish a Type 3 certification for the Type M or Type S masonry cement in accordance with Article 106-3.

1040-10 ADMIXTURES

Use admixtures that are on the NCDOT APL.

SECTION 1042
RIP RAP MATERIALS

Use field stone or rough unhewn quarry stone for plain rip rap. Use stone that is sound, tough, dense, resistant to the action of air and water and suitable in all other respects for the purpose intended. Where broken concrete from demolished structures or pavement is available, it may be used in place of stone provided that such use meets with the approval of the Engineer. However, the use of broken concrete that contains reinforcing steel will not be permitted.

All stone shall meet the approval of the Engineer. While no specific gradation is required, there shall be equal distribution of the various sizes of the stone within the required size range. The size of an individual stone particle will be determined by measuring its long dimension.

Stone or broken concrete for rip rap shall meet Table 1042-1 for the class and size distribution.

TABLE 1042-1
ACCEPTANCE CRITERIA FOR RIP RAP AND STONE FOR EROSION CONTROL

Class	Required Stone Sizes, inches		
	Minimum	Midrange	Maximum
A	2	4	6
B	5	8	12
1	5	10	17
2	9	14	23

No more than 5.0% of the material furnished can be less than the minimum size specified nor no more than 10.0% of the material can exceed the maximum size specified.

1040-9 MORTAR

Proportion mortar used in all brick and block masonry by volume as shown below. Do not add any more water than is necessary to make a workable mixture.

Mix No. 1: 1 part Portland cement
1/4 part hydrated lime
3 3/4 parts mortar sand (maximum)

Mix No. 2: 1 part Portland cement
1 part masonry cement
6 parts mortar sand (maximum)

Apply Articles 1040-5, 1040-6, 1040-7 and 1040-8 to all cement, hydrated lime, mortar sand and water.

For the hydrated lime and cement portion of Mix No. 1, the Contractor may substitute Type M or Type S masonry cement that meets ASTM C270 for Type S masonry cement the minimum compressive strength of the test specimens shall be 2,500 psi at 28 days and the test specimens shall be composed of one part Type S masonry cement and 3 parts sand. Furnish a Type 3 certification for the Type M or Type S masonry cement in accordance with Article 106-3.

1040-10 ADMIXTURES

Use admixtures that are on the NCDOT APL.

SECTION 1042
RIP RAP MATERIALS

Use field stone or rough unhewn quarry stone for plain rip rap. Use stone that is sound, tough, dense, resistant to the action of air and water and suitable in all other respects for the purpose intended. Where broken concrete from demolished structures or pavement is available, it may be used in place of stone provided that such use meets with the approval of the Engineer. However, the use of broken concrete that contains reinforcing steel will not be permitted.

All stone shall meet the approval of the Engineer. While no specific gradation is required, there shall be equal distribution of the various sizes of the stone within the required size range. The size of an individual stone particle will be determined by measuring its long dimension.

Stone or broken concrete for rip rap shall meet Table 1042-1 for the class and size distribution.

TABLE 1042-1
ACCEPTANCE CRITERIA FOR RIP RAP AND STONE FOR EROSION CONTROL

Class	Required Stone Sizes, inches		
	Minimum	Midrange	Maximum
A	2	4	6
B	5	8	12
1	5	10	17
2	9	14	23

No more than 5.0% of the material furnished can be less than the minimum size specified nor no more than 10.0% of the material can exceed the maximum size specified.

SECTION 1056
GEOSYNTHETICS

1056-1 DESCRIPTION

Provide geosynthetics for subsurface drainage, separation, stabilization, reinforcement, erosion control, filtration and other applications in accordance with the contract. Use geotextiles, geocomposite drains and geocells that are on the NCDOT APL. Products must be current with the applicable AASHTO Product Evaluation & Audit Solutions workplan to remain on the NCDOT APL. Prefabricated geocomposite drains include sheet, strip and vertical drains (PVDs), i.e., "wick drains" consisting of a geotextile attached to and/or encapsulating a plastic drainage core. Geocells are comprised of ultrasonically welded polymer strips that when expanded form a 3D honeycomb grid that is typically filled with material to support vegetation. Define geotextiles, geogrids, geocomposite drains and geocells as geosynthetics.

If necessary or required, hold geotextiles, geogrids and sheet drains in place with new wire staples, i.e., "sod staples" that meet Subarticle 1060-8(D) or new anchor pins. Steel anchor pins shall have a diameter of at least 3/16 inch, a length of at least 18 inches, a point at one end and a head at the other end that will retain a steel washer with an outside diameter of at least 1.5 inches.

1056-2 HANDLING AND STORING

Load, transport, unload and store geosynthetics so geosynthetics are kept clean and free of damage. Label, ship and store geosynthetics in accordance with Section 7 of AASHTO M 288. Geosynthetics with defects, flaws, deterioration or damage will be rejected by the Engineer. Do not unwrap geosynthetics until just before installation. Do not leave geosynthetics exposed for more than 7 days before covering except for geotextiles for temporary wall faces and erosion control.

1056-3 CERTIFICATIONS AND IDENTIFICATION

Provide Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 for geosynthetics except certifications are not required for Type 1 through Type 3 geotextiles and Type 5a geotextiles. Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 are required for Type 4a geotextiles. Define "machine direction" (MD), "cross-machine direction" (CD) and "minimum average roll value" (MARV) in accordance with ASTM D4439. Provide certifications with MARV for geosynthetic properties as required. Test geosynthetics using laboratories accredited by the Geosynthetic Accreditation Institute (GAI) to perform the required test methods. Sample geosynthetics in accordance with ASTM D4354.

Allow the Engineer to visually identify geosynthetic products before installation. Open packaged geosynthetics just before use in the presence of the Engineer to verify the correct product. Geosynthetics that are missing original packaging or product labels or that have been unwrapped or previously opened will be rejected unless otherwise approved by the Engineer.

1056-4 GEOTEXTILES

Provide geotextile types and classes in accordance with the contract.

Use woven or nonwoven geotextiles with properties that meet Table 1056-1.

TABLE 1056-1
GEOTEXTILE REQUIREMENTS

Property[A]	Requirement (MARV[A])					Test Method
	Type 1	**Type 2**	**Type 3[B]**	**Type 4a**	**Type 5a[C]**	
Typical Application	*Shoulder Drains*	*Under Rip Rap*	*Silt Fence Fabric*	*Soil Stabilization*	*Subgrade Stabilization*	
Elongation (MD & CD)[A]	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD)[A]	Table 1[D], Class 3	Table 1[D], Class 1	100 lb	-	-	ASTM D4632
Tear Strength (MD & CD)[A]			-			ASTM D4533
Puncture Strength			-			ASTM D6241
Ultimate Tensile Strength (MD & CD)[A]	-	-	-	2,400 lb/ft	Table 12[D], Class 4A	ASTM D4595
Permittivity	Table 2[D], 15% to 50% *in Situ* Soil Passing 0.075 mm	Table 6[D], 15% to 50% *in Situ* Soil Passing 0.075 mm	Table 7[D]	Table 12[D], Class 4A	Table 12[D], Class 4A	ASTM D4491
Apparent Opening Size						ASTM D4751
UV Stability (Retained Strength)						ASTM D4355

A. MD, CD and MARV per Article 1056-3.
B. Minimum roll width of 36 inches required.
C. Minimum roll width of 13 feet required unless otherwise approved by the Engineer for the application.
D. Per AASHTO M 288.

1056-5 GEOCOMPOSITE DRAINS

Provide geocomposite drain types in accordance with the contract and with properties that meet Table 1056-2.

TABLE 1056-2
GEOCOMPOSITE DRAIN REQUIREMENTS

Property	Requirement			Test Method
	Sheet Drain	**Strip Drain**	**Wick Drain**	
Width	≥ 12"	12" ±1/4"	4" ±1/4"	N/A
In-Plane Flow Rate[A] (with gradient of 1.0 and 24-hour seating period)	6 gpm/ft @ applied normal compressive stress of 10 psi	15 gpm/ft @ applied normal compressive stress of 7.26 psi	1.5 gpm[B] @ applied normal compressive stress of 1.45 psi	ASTM D4716

A. MARV per Article 1056-3.
B. Per foot of width tested.

For sheet and strip drains, use accessories (e.g., pipe outlets, connectors, fittings, etc.)

recommended by the Drain Manufacturer. Provide sheet and strip drains with Type 1 geotextiles heat bonded or glued to HDPE, polypropylene or high impact polystyrene drainage cores that meet Table 1056-3.

TABLE 1056-3
DRAINAGE CORE REQUIREMENTS

Property	Requirement		Test Method
	Sheet Drain	Strip Drain	
Thickness	1/4"	1"	ASTM D1777 or D5199
Compressive Strength[A]	40 psi	30 psi	ASTM D6364

A. MARV per Article 1056-3.

For wick drains with a geotextile wrapped around a corrugated drainage core and seamed to itself, use drainage cores with an ultimate tensile strength of at least 225 lbs. per 4 inch width in accordance with ASTM D4595 and geotextiles with properties that meet Table 1056-4.

TABLE 1056-4
WICK DRAIN GEOTEXTILE REQUIREMENTS

Property	Requirement	Test Method
Elongation	≥ 50%	ASTM D4632
Grab Strength	Table 1[A], Class 3	ASTM D4632
Tear Strength		ASTM D4533
Puncture Strength		ASTM D6241
Permittivity[B]	0.7 sec^{-1}	ASTM D4491
Apparent Opening Size (AOS)	Table 2[A], > 50% *in Situ* Soil Passing 0.075 mm	ASTM D4751
UV Stability (Retained Strength)		ASTM D4355

A. Per AASHTO M 288.
B. MARV per Article 1056-3.

For wick drains with a geotextile fused to both faces of a corrugated drainage core along the peaks of the corrugations, use wick drains with an ultimate tensile strength of at least 1,650 lbs. per 4 inch width in accordance with ASTM D4595 and geotextiles with a permittivity, AOS and UV stability that meet Table 1056-4.

1056-6 GEOCELLS

Manufacture geocells from virgin polyethylene resin with no more than 10% rework, also called "regrind", materials. Use geocells made from textured and perforated HDPE strips with an open area of 10% to 20% and properties that meet Table 1056-5.

TABLE 1056-5 GEOCELL REQUIREMENTS		
Property	**Requirement**	**Test Method**
Cell Depth	4"	N/A
Fully Expanded Cell Area	100 sq.in. max	N/A
Sheet Thickness	50 mil -5%, +10%	ASTM D5199
Density	58.4 pcf min	ASTM D1505
Carbon Black Content	1.5% min	ASTM D1603 or D4218
ESCR[A]	5000 hr min	ASTM D1693
Coefficient of Direct Sliding (with material that meets AASHTO M 145 for soil classification A-2)	0.85 min	ASTM D5321
Short-Term Seam (Peel) Strength (for 4" seam)	320 lb min	USACE[C] Technical Report GL-86-19, Appendix A
Long-Term Seam (Hang) Strength[B] (for 4" seam)	160 lb min	

A. Environmental Stress Crack Resistance.

B. Minimum test period of 168 hours with a temperature change from 74°F to 130°F in 1-hour cycles.

C. USACE

Provide geocell accessories (e.g., stakes, pins, clips, staples, rings, tendons, anchors, deadmen, etc.) recommended by the Geocell Manufacturer.

SECTION 1060
LANDSCAPE DEVELOPMENT MATERIALS

1060-1 GENERAL

Supply certifications for all landscape development materials as required below. If no certification is required, supply the Department with a statement certifying that all materials conform to these specifications and those of the NC Department of Agriculture and Consumer Services (NCDA&CS) or both. All landscape development materials shall comply with all applicable Federal and State domestic plant quarantines.

1060-2 FERTILIZER

The quality of all fertilizer and all operations in connection with the furnishing of this material shall comply with the North Carolina Commercial Fertilizer Law and with the rules and regulations, adopted by the North Carolina Board of Agriculture in accordance with said law, in effect at the time of sampling. All fertilizer will be subject to sampling and testing by the Engineer, or by an authorized representative of the North Carolina Department of Agriculture and Consumer Services, or both.

Dry fertilizer shall be manufactured from cured stock. Care for the fertilizer during handling and storing in such a manner that it will be protected against hardening, caking or loss of plant food values. Pulverize any hardened or caked fertilizer to its original condition before using.

1060-3 LIMESTONE

The quality of all limestone and all operations in connection with the furnishing of this material shall comply with the North Carolina Agricultural Liming Materials and Landplaster Act, and with the rules and regulations, adopted by the North Carolina Board of Agriculture and Consumer Services in accordance with said law, in effect at the time of sampling. All limestone will be subject to sampling and testing by the Engineer, or by an authorized representative of the North Carolina Department of Agriculture, or both.

SECTION 07900
SEALANTS AND CAULKING

PART 1 GENERAL

1.1 SUBMITTALS:

A. Shop Drawings: Submit brochures describing materials, stock colors, and the manufacturers recommendations for installation.

1.2 DELIVERY, STORAGE AND HANDLING:

A. Deliver caulking and sealant materials in original, unopened containers. Do not use air cured or moisture cured materials from broken packages.

1.3 JOB CONDITIONS:

A. Sealing and caulking compounds shall be applied within an air temperature range of 40° F to 80° F.

1.4 RELATED WORK SPECIFIED ELSEWHERE:

A. Pre Engineering Hangar Building - Section 13122.

PART 2 PRODUCTS

2.1 SEALANTS:

A. Sealant for Joints in a Vertical Plane in Concrete or Masonry: One-part polyurethane; noted "SEALANT" on the drawings. Accepted product:
   a. Mameco International VULKEM 116.

B. Traffic Joint Sealer for Control Joints in Concrete Floor Slabs: Epoxy; Shore "A" hardness 90; noted "SEALANT" on the drawings. Accepted product:
   a. Euclid Chemical Co. 495-HP.

2.2 Caulking:

A. Crack Filler; Acrylic latex gun grade caulk; ± 6% movement; noted "CAULK" on the drawings. Accepted products:
   a. Tremco Acrylic Latex Caulk.
   b. Pecora AC-20.
   c. Woodmont Chem-Caulk 600.

B. Bathtub Caulk: Silicone; color white. Accepted products:
   a. GE Sanitary Sealant SCS1702.
   b. Dow Corning Silicone Rubber Bathtub Caulk.

2.03 MISCELLANEOUS MATERIALS:

A. Joint Backing: Open cell polyurethane foam rod, or bond breaker tape compatible with sealant as recommended by the sealant manufacturer; joint backing material shall be non-reactive and non-staining.

B. Joint Primers and Cleaners: As recommended by the sealant manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION OF ONE-PART SEALANTS AND CAULKING:

A. Joint sealing and caulking is finished work. Joints shall be of uniform width, sealant and caulking surfaces shall be tooled smooth, and the surfaces of adjacent panels shall be clean.

B. Thoroughly clean all joint recesses, blow out or vacuum loose particles and dust. The sides of joint recesses shall be dry, fully cured, free of laitance, loose aggregate, form release agents, curing compound, water repellents and other surface treatments. Do not place sealants and caulking directly against incompatible materials such as asphalt saturated expansion joint fillers.

C. Install joint backing in all joints to receive sealant. Backing shall be sized to require 25% to 50% compression upon insertion and shall be placed so that sealant depth is approximately 1/2 joint width. In joints not of sufficient depth to allow backing, install polyethylene bond-breaking tape of back of joint. Avoid lengthwise stretching of backing materials.

D. Apply sealant and caulking as recommended by the manufacturer.

E. Fill joints under pressure with gun nozzle at the bottom of recess to fill joint from bottom to top and to avoid air pockets and voids.

F. All joints shall be tooled slightly concave. For polyurethane sealants, tools may be kept clean and wet with soapy water. Tooling must be accomplished at a critical time during the set of the sealant.

G. Do not cove sealant or caulking between perpendicular surfaces. Tool all sealing materials into recesses.

H. Remove all excess material adjacent to the joints by mechanical means recommended by the sealant or caulking manufacturer. Check sample of sealant or caulking with cleaning agent for effectiveness before use. Leave all work in a neat and workmanlike condition.

3.2 INSTALLATION OF EPOXY SEALANT:

A. Traffic Joint Sealer shall be mixed and applied according to the manufacturer's printed directions. Allow the concrete slabs at joints to cure 30 days before application of sealant. This sealant is self-leveling and is not tooled, however, excess material poured into joints shall be struck flush with the surface of the joint panels and the finished work left in a neat condition. Excess material must be removed at a critical time during the set of the sealant.

3.3 INSTALLATION LOCATIONS:

A. Apply Sealant:
   1. At faces of masonry control joints and expansion joints.
   2. Around penetrations of piping, conduits, ductwork through floor slabs.
   3. In two beads under exterior door thresholds.
   4. At locations noted on the drawings.

B. Apply Traffic Joint Sealer:
   1. At control joints in the field of concrete floor slabs. Fill flush with floor.

C. Apply Caulking:
   1. Around perimeter of metal frames, window frames, and louvers on interior faces of masonry walls.
   2. At joints between concrete and metal, concrete and wood, masonry and metal, masonry and wood or interior walls.
   3. At locations noted on the drawings.

D. Apply Bathtub Caulk:
   1. To joints between plumbing fixtures and adjoining wall surfaces. Tool concave and slightly recessed.

3.4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

A. All work in this section shall be included in and paid for under the "Hangar Building" item of work. Payment will be on a lump sum basis and 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.

END OF SECTION 07900

SECTION 08110
STANDARD HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 REFERENCE STANDARDS:

A. Steel Door Institute (SDI):
1. SDI 100-76 Recommended Specifications, Standard Steel Doors and Frames.

B. American Society for Testing and Materials (ASTM):
1. A366-72 Steel, Carbon, Cold Rolled Sheet, Commercial Quality.
2. A525-81 Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, General Requirements.

C. National Fire Protection Association (NFPA):
1. Standard No. 80, 1979, Fire Doors and Windows.

D. American National Standards Institute (ANSI):
1. ANSI A224.1 August 1980, Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces.
2. ANSI A155.1 - 1976, Safety Standard for Fire Door Frames.

1.2 SUBMITTALS:

A. Shop Drawings: Show elevations, construction details and materials, erection methods and attachments, hardware reinforcement and locations, metal thickness, finishes, wall conditions and location in the building.

B. Submit a letter from the manufacturer certifying that the doors and frames furnished to the project meet the requirements of this Specification.

1.3 DELIVERY, STORAGE AND HANDLING:

A. Store doors and frames at the building site under cover, off the ground, and well ventilated to prevent condensation. Remove shipping cartons, store upright, and provide spacers between doors and frames to prevent metal to metal contact.

B. Repaired doors and frames will not be accepted in the work.

C. Rusted frames will not be accepted in the work.

1.4 CERTIFICATION:

A. Fire rated doors and frames shall bear the label of Underwriter's Laboratories, Inc., rigidly attached to the hinge, stile, and jamb. Door labels shall give fire rating in hours and hardware requirements. Do not alter, damage or paint over labels during fabrication or installation.

1.5 RELATED WORK SPECIFIED ELSEWHERE:

A. Hangar Doors: Section

13122. PART 2 PRODUCTS

2.1 BASIC MATERIALS FOR ALL HOLLOW METAL WORK:

A. All hollow metal doors and frames shall conform to SDI 100 for minimum requirements and as further specified herein.

B. Steel Sheet:
   1. Cold rolled steel sheet: ASTM A 366.

C. Door Cores:
   1. Polyurethane foamed-in-place: SDI 100, para. 2.2.3.3.
   2. Honeycomb: SDI 100, para. 2.2.3.2.
   3. Polystyrene foam slab: SDI 100, para. 2.2.3.4.
   4. Unitized grid: SDI 100, para. 2.2.3.5.

D. Door Louvers: Door manufacturers standard design; fixed blade inverted Y; 16 ga. min.; 30% free area. See door schedule for sizes.

E. Welded Frames: Close corner joints tight with trim faces continuously welded and ground smooth. At mullion intersections of special frames, faces of frames shall be welded and ground smooth.

F Shop Coat: Prime paint all hollow metal work. Conform to the acceptance criteria of ANSI A224.1. Pretreatment shall be one of the following:
   1. Cold phosphate solution (SSPC-PT2).
   2. Basic zinc chromate-vinyl butyryl solution (SSPC-PT3).
   3. Hot phosphate solution (SSPC-PT4).

G. Anchors:
   1. Floor anchors: 16 gage minimum galvanized steel, adjustable to allow 1-3/8 inch extension below frame.
   2. All jamb anchors: provide one anchor per jamb for each 30 inches of door height or fraction thereof.
   3. Jamb anchors in new masonry: Masonry T Anchor or UL Masonry Anchor, 18 gage steel minimum.
   4. Jamb anchor in existing masonry: 3/8 inch FHMS in expansion shield.
   5. Spreaders: 16 gage channel, arc welded.

H. Glazing Beads: Manufacturers standard screw-on type glazing bead with mitered corners. Form beads from 20 gage steel minimum. Locate screws 1 inch from ends of beads and spaced not more than 8 inches apart.

Plaster Guards: 26 gage minimum at hardware mortises, for frame installation in masonry.

2.2 HOLLOW METAL DOORS:

A. Exterior Doors: Provide doors complying with min. requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical endurance level:

1. Level 2 and physical performance Level B (heavy duty), Model 2 (seamless).

a. Amweld 1500.
b. Ceco Regent.
c. Dittco H19.
d. Fenestra Presidential S.
e. Mesker SwingerDor.
f. Republic DM418.
g. Steelcraft L18.

2.3 HOLLOW METAL FRAMES:

A. Interior Frames: Fabricated from metallic-coated steel sheet. 1. Frames for Level 2 steel doors: .053-inch-thick steel sheet.

a. Amweld Series 400.
b. Ceco CF.
c. Fenestra.
d. Mesker.
e. Republic FE.
f. Steelcraft F16.

PART 3 EXECUTION

3.1 INSTALLATION:

A. Install frames plumb, level, true to line and rigidly secured in openings. Install doors plumb, level and true to line. Installation shall conform to SDI 100.

B. Clearance and Tolerances for Doors:

1.	Between door and jamb:	1/8 inch
2.	Between door and head:	1/8 inch
3.	Between meeting stiles of pairs of doors:	1/8 inch
4.	Between door and floor finish:	3/4 inch
5.	Between door and threshold:	3/8 inch
6.	Tolerance for doors and frames in all directions:	1/32 inch

C. Installation of Fire Rated Frames: ANSI A155.1.

D. Installation of Fire Rated Doors: NFPA 80, Chapter 2.

3.2 METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

A. All work in this section shall be included in and paid for under the "Hangar Building" item of work. Payment will be on a lump sum basis and 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.

END OF SECTION 08110

SECTION 09900
PAINTING

PART 1 GENERAL

1.1 SUBMITTALS:

A. Submit manufacturer's Product Data Sheets for each product to be used in the work.

B. Submit label analysis of each paint product to be used in the work.

C. Certificates: Submit letters of certification from the paint manufacturer certifying that topcoats are compatible and appropriate with undercoats when undercoats and topcoats are of a different manufacture.

1.2 DELIVERY, STORAGE AND HANDLING:

A. Deliver all materials to the job site in original, unopened containers with labels and tags attached. Store paint materials and tools in an assigned room. Furnish galvanized drip pans in the paint mixing space and do all mixing and handling of paint on these pans. Keep paint cans closed when not in use, and keep the room clear of oily rags and other waste that might create a fire hazard.

1.3 JOB CONDITIONS:

A. Refer to the paint manufacturer's Product Data Sheets for paint application job condition.

B. Spaces to be painted shall be broom clean and dust free.

1.4 RELATED WORK SPECIFIED ELSEWHERE:

A. Factory Finished Items.

B. Shop Coats.

C. Pre-Engineered Hangar Building - 13122.

PART 2 PRODUCTS

2.1 PAINT SELECTION:

A. Materials selected for each painting system shall be the product of a single manufacturer.
B. Thinners, solvents, and tinting colors shall be as specified on the manufacturer's Product Data Sheets.

C. All paint shall be factory mixed except tinting necessary to distinguish undercoats.

D. Colors shall be selected by the Owner.

2.2 ACCEPTED PAINT PRODUCTS

A. Alkyd Rust Inhibitive Primer:
PPG 6-208
Glidden 4570
Porter 297

B. Alkyd Universal Steel Primer:
PPG 97-682
Glidden 5210
Porter 284

C. A8046 Alkyd-Zinc Dust Primer:
PPG 6-215/6-216
Porter 299

D. Alkyd-Portland Cement Primer:
PPG 6-209
Glidden 5229
Porter 290

E. Phosphoric Acid Treatment:
Porter 99

F. Alkyd Interior Wood Undercoater:
PPG 6-6
Glidden 555
Porter 429

G. Latex Block Filler:
PPG 6-7
Glidden 5320
Porter 896

H. Cementitious Block Filler:
Glidden 1971
Porter 895

I. Alkyd Gloss Enamel:
PPG 6-252 Series
Glidden 4500 Series
Porter I.A. 24

J. Alkyd Interior S.G. Enamel:
PPG 6-90

Glidden
Porter I.A. 24 S.G.

K. Polyamide Epoxy Gloss Coating:
PPG 97 Line
Glidden 5240/5242
Porter MCR 43

L. Polyamide Epoxy High Build Intermediate Coat:
PPG 97-150 Series
Glidden 5555/5556
Porter MCR 43 High Build

Alternative, equivalent paint products may be submitted to the Owner for review and approval.

PART 3 EXECUTION

3.1 SURFACE PREPARATION:

A. All Surfaces: Before starting work, examine all surface which are to be painted. Do not apply paint on dirty, dusty, or otherwise contaminated surfaces, nor on surfaces of materials having more than 15% moisture content. Do not start work on any surface requiring corrective work. Start of work constitutes acceptance of surface as suitable for painting.

B. Ferrous Metals: Minimum surface preparation for ferrous metals shall be SSPC-SP1 (Solvent Cleaning) and SSPC-SP3 (Power Tool Cleaning). SSPC-SP7 (Brush-off Blast Cleaning) may be substituted for SSPC-SP3. Remove all oil, grease, dirt, salts, loose rust, loose mill scale, and loose paint. Remove shop crayon marks. Other surface preparation shall be as described under PAINT SYSTEMS or as shown on the drawings.

C. Galvanized Steel:
1. Remove oil and grease by wiping with clean rags soaked in xylol.
2. Remove white rust with soap and water and rinse clean.
3. Remove red rust by power tool cleaning.
4. Deactivate fresh zinc surfaces and remove passivating compounds by weathering six months or by applying phosphoric Acid Etch.

D. Concrete Block: Let the concrete unit masonry cure for 30 days before painting. Fill all minor holes and cracks. Rub to remove mortar burrs from surface of joints and block.

E. Wood: Sand to remove raise grain, tool marks and similar imperfections. After prime coat has dried, putty nail holes, cracks, open joints and other defects. At the same time, seal knots, pitch and resinous

3.2 PAINT APPLICATION SCHEDULE:

A. Paint the following:
1. All new materials shall be painted as described under PAINT SYSTEMS unless

excluded in paragraph B below, or unless excluded by the FINISH SCHEDULE.

2. Paint exposed steel pipe, brackets, hangers, valve bodies, electrical conduits, outlet boxes and junction boxes.
3. Paint exposed pipe insulation.

B. Do not paint the following:

1. Steel to be embedded in concrete.
2. Factory items fully finished.
3. Exterior formed concrete foundation walls, steps or slabs on grade, unless noted otherwise.
4. Interior concrete floor slabs, unless noted otherwise.
5. Aluminum, brass, cadmium plated surfaces, and stainless steel.
6. Interior air handling ductwork.
7. Acoustical ceiling board.
8. Plastic pipe and plastic conduit.
9. Plastic pipe insulation covers.
10. Code required labels.

3.3 PAINT SYSTEMS:

PS-1 Alkyd Enamel on Exterior Steel:

Surface Preparation: SSPC-SP1 and either SSPC-SP3 or SSPC-SP7.

1st Coat:	Rust Inhibitive Steel Primer Red	@ 2 mils DFT.
2nd Coat:	Alkyd Gloss Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd Gloss Enamel	@ 2 mils DFT.

PS-2 Alkyd Enamel on Interior Steel:

Surface Preparation: SSPC-SP1 and either SSPC-SP3 or SSPC-SP7.

1st Coat:	Shop Coat or Rust Inhibitive Steel Primer	@ 2 mils DFT.
2nd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.

PS-3 Alkyd Enamel on Interior Steel Pipe:

Surface Preparation: SSPC-SP1 and either SSPC-SP3 or SSPC-SP7.

1st Coat:	Alkyd Universal Steel Primer	@ 2 mils DFT.
2nd Coat:	Alkyd Gloss Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd Gloss Enamel	@ 2 mils DFT.

PS-4 Alkyd Enamel on Exterior Galvanized Steel: Surface Preparation:
SSPC-SP1 Treatment: Phosphoric Acid Treatment

1st Coat:	Alkyd-Zinc Dust Primer	@ 2 mils DFT.
2nd Coat:	Alkyd-Gloss Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd-Gloss Enamel	@ 2 mils DFT.

PS-5 Alkyd Enamel on Interior Galvanized Steel: Surface Preparation:
SSPC-SP1.

1st Coat:	Alkyd-Portland Cement Primer	@ 1.5 mils DFT.
2nd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.

PS-6 Alkyd Enamel on Interior Wood:

1st Coat:	Alkyd Enamel Interior Wood Undercoater	@ 2 mils DFT.
2nd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.
3rd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.

PS-7 Polyamide Epoxy Coating on Interior Concrete Block:

1st and 2nd Coats:	Cementitious Block Filler	@ 15 mils DFT total.
3rd Coat:	Polyamide Epoxy	@ 4 mils DFT.
4th Coat:	Polyamide Epoxy Gloss Coating	@ 2 mils DFT.

PS-8 Alkyd Enamel on Interior Concrete Block:

1st and 2nd Coats:	Latex Block Filler	@ 15 mils DFT total.
3rd Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.
4th Coat:	Alkyd Interior S.G. Enamel	@ 2 mils DFT.

A. Paint shall be tinted, reduced, mixed and applied according to the manufacturer's Product Data Sheets listed in paragraph 2.02, except that thickness of coats shall be as shown on the drawings under PAINT SYSTEMS.

B. Flow all paint evenly and fully over surfaces being painted. Leave each coat free of brush marks, voids, sags, runs or other defects. Each coat shall be applied as a film of uniform thickness. Hiding shall be complete.

After application of Block Filler, screen with hardware cloth to remove burrs and other roughness.

C. Do not thin the paint for any coat to a degree that reduces the finished dry film thickness below that specified.

D. Vary the tints of undercoats to distinguish coat number.

E. Removed hardware, accessories, fixtures, switch plates and similar items and replace after painting. Remove paint from all surfaces not intended to be painted.

F. Paint sharp clean edges at perimeter of painted surfaces and at changes of color.

G. Paint primed grilles, access panels, ducts, etc., to match adjacent wall or ceiling surface.

Apply all paint with brush or roller except where spraying is recommended for ceilings and/or epoxy wall finishes. Overspray on surfaces scheduled to be unfinished shall be repaired by removing the overspray or by painting the entire surface at the Owner's option.

J. Back prime concealed surfaces of plywood, millwork and ungalvanized ferrous metals.

K. Mildew: Remove mildew from all surfaces with a solution made as follows:
1/3 Cup Trisodium Phosphate (Soilax or equal)
1/3 Cup Detergent (Tide or equal)
1 Quart 5% Sodium Hypochlorite (Chlorox or equal) 3
Quarts Warm Water

Scrub the mildewed areas with a medium soft brush. When the surface is clean, rinse thoroughly with fresh water from a hose. Let dry at least two days before painting.

3.4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

A. All work in this section shall be included in and paid for under the "Hangar Building" item of work. Payment will be on a lump sum basis and 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.

END OF SECTION 09900

SECTION 13122
PRE-ENGINEERED HANGAR BUILDINGS

PART 1- GENERAL

The Contractor shall provide all labor and materials for the construction/erection of three pre-engineered metal Storage Hangar buildings with one-piece hydraulic operated doors. The buildings nominal dimensions are to be 60'x60' (Hangar 5), 60'x60' (Hangar 4) and 80'x 80 (Hangar 12), as shown on the plans. The building shall be designed and constructed in accordance with the North Carolina Building Code-Latest Edition, NFPA 409, NFPA 101, and all other applicable codes. The Contractor shall be responsible for completion of all associated work necessary and as indicated on the plans and outlined in the specifications for delivery to the owner of a finished product with occupancy approval. The Contractor will be required to submit detailed building plans for review and issuing of permits from the Johnston County Building Inspections Department. The Contractor shall be responsible for payment of all required permits. The building plans shall be sealed by an Architect or Engineer as applicable which is licensed to perform work in the state of North Carolina.

All products and work are intended to be complete in all aspects, including accessories required for a turn-key product for hangar building construction, to include interior space up fitting where indicated.

Concrete and Soil Compaction Testing. The Owner will employ and pay for testing of concrete prior to being installed and soil compaction testing. The Contractor shall be responsible for scheduling the testing company.

Sanitary Facilities. The General Contractor shall provide and maintain chemical type toilet facilities for the use of his employees.

The General Contractor shall make all arrangements and pay all charges for a temporary water, lighting system, construction power, and temporary heating for construction in compliance with state and local requirements.

The Contractors may use a designated area, as indicated on drawings, for construction staging, construction trailers and storage of materials. It is the Contractor's responsibility to provide a temporary fence enclosing his designated staging/laydown area if desired other than what is provided by the Owner. Contractor shall restore staging area back to its original condition.

1.1 SUMMARY

A. Scope: These specifications cover the materials and fabrication of metal buildings designed, fabricated and readily erected to be weather tight. These specifications are an outline of performance to insure the basis for design, manufacture and application of all the manufacturer's metal building systems.

B. Building Description: A rigid frame, modular span, tapered column, double slope roof, engineered steel building, see drawing for roof slopes. See drawing for eave heights and dimensions.

C. Building Nomenclature:
1. Width shall be as measured from outside of wall to outside of wall.
2. Length shall be as measured from outside of wall to outside of wall.
3. Eave height shall be measured from the top of the eave purlin or door truss to the bottom of perimeter column base plate.

4. Hydraulic door size shall be the clear opening. All dimensions are nominal.

All structural and non-structural components of the hangar building, excluding the concrete slabs and foundations, are supplied by the pre-engineered hangar manufacturer. Supplier is to warranty all components of building.

Hangar building shall be supplied by a manufacturer who is regularly engaged in the manufacture of aircraft hangar buildings. Contractor shall ensure that all aspects of the hangar building construction and hangar door are compatible and result in a weather tight seal. The hangar manufacturer shall have been engaged in the manufacture for a minimum of five years and upon request from Owner provide a list of completed hangar projects.

D. Drawings and Certifications:
Drawings: Manufacturer shall furnish complete erection drawings for the proper identification and assembly of all building components. These drawings will show anchor bolt settings, transverse cross sections, sidewall, endwall. Roof framing, flashing, sheeting and accessory installation details.

Certifications: Standard drawings and design analysis shall bear the seal of a registered professional engineer licensed in the state of North Carolina. Design analysis shall be furnished to the Owner. The Manufacturer shall furnish a sealed letter of certification stating that the building design and fabrication will meet all design specifications and loads as required by applicable codes. <u>This letter must be furnished prior to delivery of building.</u>

2. <u>STRUCTURAL STEEL DESIGN</u>

A. General: The building manufacturer shall use standards, specification, recommendations, findings, and/or interpretations of professionally recognized groups (AISC, AISI, AAMA, AWS, ASTM, MBMA). Federal Specifications and unpublished research by MBMA as the basis for stabling design, drafting, fabrication and quality criteria, practices and tolerances. For convenience, one or more sources may be referenced in a portion of these specifications.

B. In all instances, however, the manufacturer's design, drafting, fabrication, quality criteria, practices and tolerances shall govern, unless specifically countermanded by the Contract Documents. Structural mill sections or welded up plate sections will be designed in accordance with AISC's "Specification of the Design, Fabrication, and Erection of Structural Steel for Buildings" (latest edition).

Cold-formed steel structural members will be designed in accordance with AISI's "Specification for the Design of Cold-formed Steel Structural members" (latest edition)

Design Loads: Design loads will include dead load, roof live loads, wind load, seismic loads, collateral loads, auxiliary equipment loads, and/or other applied or specified loads.
Dead Loads: The actual weight of the building system supported by a member.
Roof Live Loads: Loads produced by maintenance activities, rain, erection activities and other movable or moving loads, but not including wind, snow, seismic, crane, or dead loads.
Roof Snow Loads: Gravity load induced by weight of snow or ice on the roof, assume to act on horizontal projection of the roof.
Winds Loads: The loads on a structure induced by the forces of wind blowing from any horizontal direction.
Collateral Loads: The weight of any non-moving equipment of material, such as ceilings, electrical

or mechanical equipment, sprinkler systems or plumbing.
Seismic Loads: Horizontal loads acting in any direction on a structural system due to action of an earthquake.
Floor Live Loads: Loads induced on a floor system by occupants of a building and their furniture, equipment, etc.
(Shall be in accordance with the latest international building code with North Carolina amendments).

C. Basic Material Specifications. Primary Framing Steel: Steel for hot rolled shapes conform to the requirements of ASTM Specification A-36, with minimum yield of 36,42 or 50 psi.

Steel for built up sections shall conform to the physical requirements of ASTM D570, ASTN 572 or ASTM A36 as applicable, with minimum yield of 42,000, 50,000 psi as indicated by the design requirements. Steel for endwall "C" sections shall conform to the physical requirements of Republic Steel's P-55 or equivalent and have a minimum yield of 55,000 psi.

Secondary Framing Steel: Steel used to form purlins, girts, eave struts and "C" sections shall be Republic Steel's P-55 or equivalent of ASTM A607 Grade 55. Minimum yield shall be 55,000 psi.

3 STRUCTURAL FRAMING

General: All framing members shall be shop fabricated for field bolted assembly. The surfaces of the bolted connections shall be smooth and free from burrs or distortions.

A. Primary Framing:

Rigid Frame: All rigid frames shall be connected to webs by means of a continuous fillet weld on one side.

Endwall Frame: All endwall roof beams and endwall columns shall be cold-formed "C" sections, mill rolled sections or built up "I" sections depending on design requirements.

Plate, Stiffeners, etc.: All base plates, splice and flanges shall be shop fabricated to include bolt connections holes. Webs shall be shop fabricated to include bracing holes.
Connections for secondary structural (purlins and girts) shall be by means of welded clips.

B. Secondary Framing:

Purlins and Girts: Purlins and girts shall be cold-formed "Z" sections with stiffened flanges. They shall be pre-punched at the factory to provide for field bolting to the rigid frames. They shall be simple or continuous span as required by design. Connection bolts will install through the webs, not flanges.

Eave Struts: Eave struts shall be unequal flange cold-formed "C" sections.

C. Bracing:

Provide wind bracing, rafter bracing, sheeting angles where required.

Diagonal Bracing: Diagonal bracing in the roof shall be used to remove longitudinal loads from the structure. This bracing will be furnished to length and equipped with bevel washers and nuts at each end. It may consist of rods threaded each end or galvanized cable with suitable threaded end anchors.

If load requirements so dictate bracing may be of structural angle and/or pipe, bolted in place.

Flange Braces: The compression flange of all primary framing shall be braced laterally with angles connecting to the webs of purlins or girts so that the flange compressive stress is within allowable limits for any combination of loading.

4. MISCELLANEOUS MATERIAL SPECIFICATIONS

A. Roof: Panel shall be 24 gauge. GALVALUME panels shall have a factory applied mastic in the female lag. Panel, finish shall be smooth. All panels shall be sealed at the eave. System shall be installed with fixed clips 3" fiberglass insulation and 1" thermal spaces. Screws at end laps shall be stainless steel. All attachments methods shall be recommended by manufacturer.
Wall Panels: Panel shall be 26 gauge painted with standard factory paint finish and installed according to manufacturer's requirements. Color shall be selected from manufacturer's standard color chart. All wall panels shall be furnished full height.

B. Sealants and Closures:
Caulk: All gutter and downspout joints, rake flashing laps, ridge flashing laps, shall be sealed with pigmented caulk of butyl rubber base to match the color.
Factory applied sealant used tin panel sidelaps shall be a hot melt, foamable mastic.
Field applied sealant used at the endlaps, ridge assembly, and gable flashings shall be 100% solids, butyl-based elastomeric tape sealer, furnished in roll form or pre-cut to length. Sealant used to the eave shall be pre-compressed expanding foam sealant tape.
Inside closures shall be 18-gauge metal.

Gutter, Flashing, And Downspouts:
Gutters and Flashing: All standard exterior gutters, rake flashing and downspouts are 26-gauge galvalume steel, with painted finish to match.

Flashing and Trim: Flashing at the rake (parallel to roof panels) and high eave shall not compromise the integrity of the roof system by constricting movement due to thermal expansion and contraction. The panel manufacturer shall supply the flexible membranes if applicable.

Installation: Erection of the roof system shall be in complete accordance with the manufacturer's erection manual.

5. PAINTING
Structural Painting: All uncoated structural steel shall be cleaned of all foreign matter and loose scales in accordance and given a one mil coat of red oxide primer. Primer shall be applied by the use of airless handguns. Primer meets or exceeds the performance requirements of Federal Specification TT-P0636D. Light gauge steel members shall be shot blasted and precoated with one coat of red oxide primer. Some hand sprayed shop touch up may be employed. Primer shall be furnished to touch up al abrasions caused by handling, all members (if required) shall be touched up prior to field assembly.

Painted Steel Panels: (Work this paragraph shall be compatible with finish coating)
Base metal shall be 26-gauge galvalume steel.
Prime Coat: The base metal shall be pre-treated and then primed with an epoxy type primer for superior adhesion and superior resistance to corrosion.

6. ACCESSORIES
Insulation: Roof = 4 inches and walls = 3 inches with scrim reinforced white vinyl. Office and Bathroom finished areas shall be minimum r-19.

7. HANGAR DOORS
Doors shall be flush mounted hydraulic type, Schweiss Doors or approved.

A. The hangar doors shall be compatible with the building structural system and shall result in a completely weather-proof system.

B. The door framing shall be designed to carry its own dead load and resist horizontal wind pressure as specified by code.

C. Exterior door paneling and trim shall match the building wall panels.

D. Door insulation shall be the same as wall panel insulation.

E. All door framing shall be shop primed the same as the structural framing members.

8. ERECTION AND INSTALLATION. The erection of the metal building and the installation of accessories shall be performed in accordance with erection drawings by a qualified erector using proper tools and equipment. In addition, erection practices shall conform to Section 5, MBMA "Code of Standard Practice". There shall be no field modifications to primary structural members except as authorized and specified by the manufacturer.

ALL OSHA SAFTEY REQUIREMENTS SHALL BE ADHEARED TO INCLUDING 100% FALL PROTECTION WHEN ABOVE 6'-0" WORKING HEIGHT SPECIFICALLY INCLUDING ROOF INSTALLATION.

9. BUILDING ANCHORAGE AND FOUNDATIONS. The building anchor bolts shall be designed to resist maximum column reactions resulting from the specified combinations of loadings. These designs and sizes shall be specified by the building manufacturer.

Contractor shall be responsible for the complete design of the building foundations and floor slabs. Floor slabs shall meet the minimum requirements detailed in the project plans. The plans shall be sealed by an Architect or Engineer as applicable which is licensed to perform work in the state of North Carolina.

10. THERMAL AND MOISTURE PROTECTION
Vinyl faced insulation shall be provided for roof, walls, and doors of pre-engineered steel building.

11. VAPOR BARRIER
Vapor barrier beneath hangar floor slab shall meet the following requirements:

Plastic Vapor Retarder: ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397, not less than 6 mils 6 thick. Include manufacturer's recommended adhesive or pressure- sensitive joint tape.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Fortifiber Building Systems Group; Moistop Ultra A.

b. Raven Industries Inc.; Vapor Block 10.
c. Reef Industries, Inc.; Griffolyn [Type-85].
d. Stego Industries, LLC; Stego Wrap, 10 mil Class C.

Place, protect, and repair sheet vapor barrier according to ASTM E 1643 and manufacturer's written instructions. Lap joints 6 inches and seal with manufacturer's recommended tape.

12. DOORS AND WINDOWS

Exterior Steel Doors: Shall be furnished by the pre-engineered building manufacturer.

13. METHOD OF MEASUREMENT/BASIS OF PAYMENT

All work in this section shall be included in and paid for under "Hangar Building" item of work. Payment will be on a lump sum basis and shall be full compensationfor furnishing all materials, for preparing and placing these materials, and for all labor, equipment, tools and incidentals necessary to complete the item.

END OF SECTION 13122

DIVISION V

APPENDICES

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Appendix A
Construction Safety & Phasing Plan (CSPP) Report

Construction Safety & Phasing Plan

for the

Multi-Unit Hangar Development, Phase 1

at Curtis L. Brown, Jr. Field (EYF)

Prepared for:
Town of Elizabethtown
805 W Broad Street
Elizabethtown, North Carolina 28337

Prepared by:

WK Dickson, an Ardurra Company
720 Corporate Center Drive
Raleigh, North Carolina 27607
Phone: 919-782-0495
NC License No. F-0374

February 28, 2025

WK Dickson Project No. 20240744.00.WK

Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction & Project Description

The Town of Elizabethtown, NC (Owner) wishes to continue development at the Airport with a hangar and associated asphalt apron on the terminal side of the runway as shown in Figure 1 below. The Owner has selected WK Dickson, an Ardurra Company (Engineer) to assist with this project.

Aviation safety is the primary consideration at airports, especially during construction. This Construction Safety and Phasing Plan will serve as a companion document to the project plans and specifications for the Multi-Unit Hangar Development, Phase 1 project and has been written in compliance with FAA AC 150-5370-2G, Operational Safety on Airports during construction. The phasing developed for this project is intended to minimize the impact the project will have on airport operations while providing a logical sequence of construction activities. The subsequent sections of this document will address scheduling, coordination, and airfield safety precautions as they relate to the project.

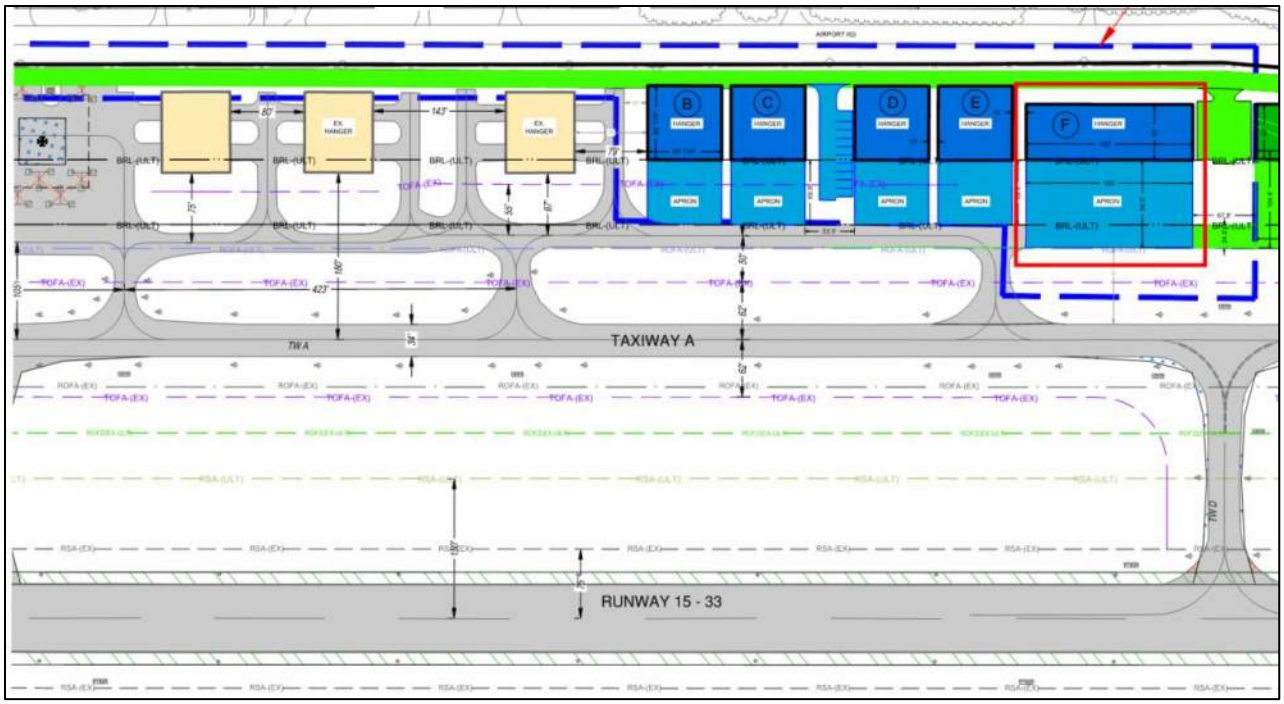


Figure 1 EYF Multi-Unit Hangar Development, Phase 1 Project Area (outlined in **red**)

2. Coordination

A. Project Contacts

Below is a comprehensive list of parties involved during the design of the Multi-Unit Hangar Development, Phase 1 project.

Table 1 Project Contacts

Organization	Role	Point of Contact	Contact Information
WK Dickson & Co., Inc.	Consultant	Jamie Peck Project Manager	Phone: 540-250-6892 Email: jpeck@wkdickson.com
Town of Elizabethtown	Sponsor	Dane Rideout Town Manager Rusty Worley Town Planner	P: 910-862-2066 E: drideout@elizabethtownnc.org P: 910-862-2066 E: rworley@elizabethtownnc.org
NCDOA	State Engineer	Tommy Mann Eastern Lead	P: 919-814-0554 E: tlmann@ncdot.gov

B. Design Submittals

Throughout design, coordination between WK Dickson, EYF, and NCDOA was required. Project documents will be reviewed by EYF and the NCDOA at the 90% and 100% design phases. Below is a summary of the anticipated project schedule:

Table 2 Schedule of Project Submittals & Milestones

Submittal	Date
90% Design Documents	January 24, 2025
100% Design Documents/Advertise for Bidding	March 8, 2025
Pre-Bid Meeting	March 19, 2025
Bid Opening	April 2, 2025
Contract Execution*	August 1, 2025
Pre-Construction Meeting*	August 5, 2025
Notice to Proceed*	August 8, 2025

**Estimated dates*

C. Pre-Bid Meeting

A pre-bid meeting will be held. The meeting will provide bidding firms to ask project specific questions. General outline of topics covered are:

- Project Overview,
- Proposal Requirements,
- Construction Safety and Phasing Plan (CSPP), and
- Questions and Answers.

D. Pre-Construction Meeting

A pre-construction meeting will be held prior to issuance of Notice to Proceed. At a minimum, required attendees will include the Airport Engineer, airport operations staff, Resident Project Representative (RPR), project superintendent and foreman of the Prime Contractor, as well as the project foreman for each sub-contractor employed by the Prime Contractor. A general outline of topics covered are:

- Project Overview and Safety Items,
- Construction Items,
- Labor Requirements, and
- Civil Rights Requirements.

E. Construction Progress Meetings

In addition to the pre-construction meeting, regular construction progress meetings will be held throughout the duration of the project. At a minimum, required attendees will include the Airport Engineer, airport operations staff, the Construction Administration Engineer, construction observation staff, project superintendent and foreman of Prime Contractor, as well as the project foreman for each Sub-Contractor with work occurring during the current period. Construction phasing and safety will be a standing agenda item at the Construction Progress Meetings.

F. Daily Coordination

At all times when construction activities are being performed on this project the prime Contractor must have a foreman on-site or immediately available who is authorized to make decisions regarding the operations and safety of all personnel employed by the Contractor and Sub-Contractors.

The Contractor must provide a minimum of 48-hour notice to the Owner before accessing any secured work area that will impact airside operations.

3. Phasing & Contract Time

A. Contract Time

The Owner also requested that WK Dickson explore options to reduce the project scope and cost to better align with the budget. After reviewing the 90% design documents, the Owner and WK Dickson decided to structure the bidding process into two (2) bid schedules.

- **Bid Schedule #1** includes a 160' x 60' hangar building with associated apron space
- **Bid Schedule #2** includes an 80' x 80' hangar building with associated apron space

This approach provides flexible pricing options, allowing the Owner to select the schedule to meet budget constraints.

The total contract duration for each bid schedule is as follows:

- **Bid Schedule #1:** 180 consecutive calendar days
- **Bid Schedule #2:** 130 consecutive calendar days

B. Construction Phasing

A snapshot of the work area is shown below in Figure 2. For a visual representation and descriptions of the milestone construction activities for this project, please refer to the Construction Safety and Phasing Plan (found in Appendix A). The two major components of work for this project involve the hangar building (sizing dependent on selected bid schedule) and the construction of the asphalt apron.

This project consists of a base bid that generally includes the following elements:

- Issue NOTAM for construction work on the airfield.
- Install erosion control measures, construction entrances, contractor staging areas, haul routes, a new vehicle gate, and lighted barricades.
- Perform earthwork and grading.
- Conduct subgrade proof rolling and preparation for apron and building areas, including testing and a topographic survey.
- Fine grade the building pad area for stone placement and foundation construction.
- Complete utility installations and building construction.
- Install 6-inches of P-209 base course for the apron, including testing and a topographic survey.
- Mill existing Taxiway A3 pavement as noted in the plans for tie-in.
- Install two 2-inch lifts of P-401 asphalt surface course for the apron, including testing and a topographic survey.

- Fine grade and stabilize the site.
- Install temporary pavement markings as per the plans.
- Remove lighted barricades and open the apron and the closed portion of Taxiway A3.

Because the proposed project work is located outside the existing runway clearance and protection areas, it is not anticipated to close the runway or airfield and impact operations. There will be closure of a portion of existing Taxiway A3 leading to the project area for the duration of construction. This is indicated on the Construction Safety and Phasing Plan.

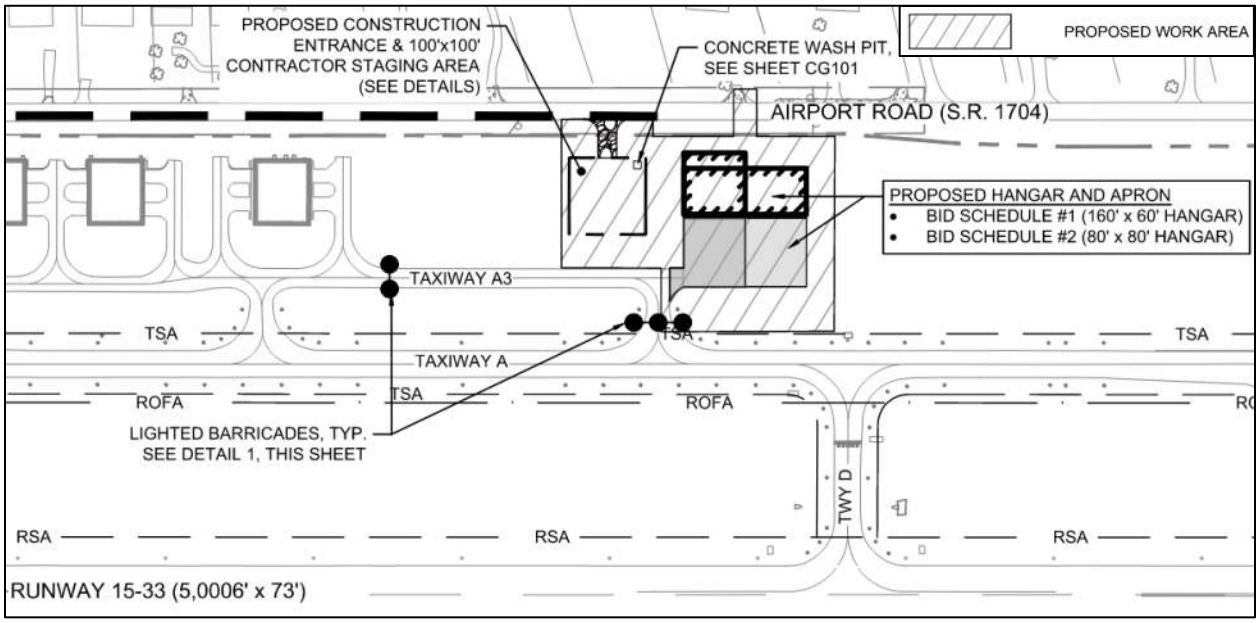


Figure 2 Proposed EYF Multi-Unit Hangar Development, Phase 1 Work Area

C. Areas & Operations Affected by Construction Activity

Aircraft operations are expected to experience minimal impact during construction. The runway, taxiways, and apron will remain open throughout the project.

For safety, it is recommended to place lighted barricades on the existing Taxiway A3, as detailed in the CSPP, for the project's duration. While this will result in a partial closure of Taxiway A3, the impact on airport operations is expected to be minimal.

Minimal grading work is planned within the existing ditch adjacent to Taxiway A to tie the new apron into the existing ditch system; however, this work is anticipated to occur outside the Taxiway A TSA. All construction activities will remain outside the ROFA and RSA.

Table 3 Runway & Taxiway Safety Areas

Location	Aircraft Approach Category	Airplane Design Group	RSA or TSA Width in Feet (divided by two)
15	B	II	75′
33	B	II	75′
Taxiway A	TDG-2A		39.5′

4. Navigation Aid (NAVAID) Protection

No navigational aids will be impacted by the work done on this project. Should the scope of the project be modified and interrupt NAVAID service due to construction occur, the Contractor shall notify the Airport FBO and emergency NCDOA contact immediately.

5. Contractor Access

A. Staging Area(s) & Project Access

The proposed location of the Contractor staging area is shown in Figure 2. The staging area, haul route, and temporary construction entrances are within the overall limits of disturbance.

From the Contractor staging area, the Contractor will have full access to the project area. It will be indicated on the construction plans that there should be minimal construction traffic on the existing Taxiway A3 pavement. There will be no need for the Contractor to enter any other areas of the secure airfield during construction.

It is proposed to use the existing Airport Road (S.R. 1704) as the Contractor's haul and access route to the project area. Please refer to the Construction Safety and Phasing Plan for the demarcation of the Contractor haul/access route.

B. Location of Stockpiled Construction Materials

Based on the completed grading and earthwork design, no stockpile materials will be generated on-site. However, embankment material will need to be brought to the site for construction purposes. An existing stockpile, located on Airport property just northeast of the project site with access via Airport Road, is proposed to supply the required embankment material. This stockpile and its access route are indicated on the Construction Safety and Phasing Plan (CSPP).

The Contractor is responsible for removing all other materials from the project site and disposing of them off Airport property in a safe and legal manner.

Stockpiled materials and equipment storage are not permitted within the RSA, OFZ, or the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment

adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. This includes determining and verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material.

C. Vehicle & Pedestrian Operations

Vehicle operators at airports face conditions that are not normally encountered on public streets and highways. Therefore, anyone with vehicular access to the movement and safety areas, and a need to be there, must have an appropriate level of knowledge of airport rules and regulations. All persons operating motor vehicles or equipment must possess a valid operator's license as required by the State of North Carolina. The Airport may establish identification requirements that would permit the operation of a vehicle in the movement and safety areas of the airport. Any person expected to operate in the movement and safety areas shall be qualified and authorized to operate in this environment.

a. Construction Site & Equipment Parking

The Contractor will provide for employee parking within the staging areas. At the end of each workday, the Contractor shall position all equipment, tools, materials, etc. in the approved staging areas. Equipment not in use shall be parked in the Contractor's staging areas.

b. Access & Haul Routes

The Contractor's access location and haul routes are shown on Sheet G101 Construction Safety & Phasing Plan. Personnel, equipment, or other construction-related material will not be allowed inside the secured airfield while the airport is in operation. Anyone found in restricted areas or crossing active runways, taxiways, and aprons will be promptly and permanently removed from the airport.

c. Marking & Lighting of Vehicles

All vehicles used on the airport must be provided with marking and lighting in accordance with FAA Advisory Circular 150/5210-5.

1) Each Contractor licensed vehicle must display a company logo on both sides of sufficient size to be recognizable to personnel. Signs shall be approved by the airport. The company name on the signs must be at least 4 inches in height. Specialized construction equipment does not require signs.
2) Each Contractor licensed vehicle must have a yellow/amber rotating beacon affixed to the uppermost part of the vehicle. Light must be visible from any direction, day, and night, including the air. Specialized construction equipment does not require rotating beacon lights.
3) Contractor vehicle marking and lighting is the sole responsibility of the Contractor. The airport will not provide markings or lights.

d. Description of Proper Vehicle Operations

The Contractor shall adhere to the following:

1) All persons operating motor vehicles or equipment must possess a valid operator's license as required by the State of North Carolina.
2) No person shall operate a motor vehicle or other motorized equipment of any kind on the airport in a reckless or negligent manner or without caution or in any manner that endangers or is likely to endanger persons or property.
3) All speed limits established by the Owner shall be always obeyed.
4) No person shall fail to give pedestrians the right of way over vehicular traffic.
5) No person operating a motor vehicle on the airport shall fail to give proper signals or fail to observe the directions of posted traffic signs or traffic lanes.
6) No person under the influence of alcohol or drugs shall operate a motor vehicle on the airport property.
7) Contractor will not be allowed to operate motor vehicles outside of the designated work areas as shown on the plans.
8) Driving privileges to operate in movement areas are limited to vehicles with an operational necessity who have been approved by the Airport Operations Staff.
9) The airport staff shall have the authority to tow or otherwise move motor vehicles that are parked by their owners or operators on the airport in violation of the regulations of the airport, at the operator's expense and without liability for damage that may result during or by reason of such moving.
10) All vehicles operating on the airport must have their head/taillights turned on during darkness and low visibility conditions.

e. Situational Awareness

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. Aircraft shall always have the right of way.

f. Two-Way Radio Communication Procedures

1) **General.** Prior to entering any movement area Ground Control must be contacted via the ground frequency.
2) **Areas Requiring Two-Way Radio Communication with the Airport Operations Staff.** Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the Airport Operations Staff, escort, flagman, signal light, or other means as designated by the Owner.
3) **Frequencies to be Used.** CTAF/UNICOM: 122.80 MHz.

g. Maintenance of the Secure Area of the Airfield

1) The Contractor shall be required to maintain security at the access gate used for construction. The gate shall be equipped with locks provided by the Owner. Contractor shall maintain strict control over all keys and shall limit their distribution. Construction access gate must always be manned by Contractor personnel when the gate is unlocked. Report any missing keys immediately.

2) Contractor must establish, and submit for review and approval, procedures for ensuring that only authorized persons and vehicles enter the AOA through the access gate. EYF does not require personnel to be badged for entry into the AOA. Contractor must obtain approval from the owner to open any gate to the AOA.

6. Wildlife Management

Various Contractor operations during construction can directly or indirectly create wildlife hazards at airports.

A. Trash

The Contractor shall perform trash clean-up, including food scraps from construction personnel activity, daily.

B. Standing Water

Standing water is a potential wildlife hazard that can be created from construction activity or rainfall events. For this project, standing water will not be allowed to stand after a rain event for more than 48 hours. The Contractor will take precautions and have ready, at no additional cost to the Owner, a pump to remove standing water from the project area by pumping it to the nearest stormwater inlet.

C. Tall Grass & Seeds

Tall grass and seeds represent another wildlife attractant on airfields. The Contractor is responsible for maintaining its staging and parking areas free from tall stands of grass. The Contractor shall comply with the requirements outlined in Section T-901 of the specifications and the construction plans regarding seeding.

D. Poorly Maintained Fencing & Gates

The Contractor, Engineer/RPR, and Airport representative shall perform inspections of the site daily. The Contractor shall immediately report any damage to gates or fence. The Contractor will be responsible for repairs caused by negligence by the Contractor.

7. Foreign Object Debris (FOD) Management

A. Description of FOD

Foreign object debris at airports includes any object found in an inappropriate location that can damage aircraft, equipment, or airport personnel. On construction sites FOD typically is comprised of loose gravel, blowing sand, wire bristles from sweeper heads, food wrappers, material packaging. The presence of FOD on an airport's AOA poses a significant threat to the safety of air travel. FOD has the potential to damage aircraft during critical phases of flight, which can lead to catastrophic loss of life and airframe, and at the very least increased maintenance and operating costs.

B. Methods of FOD Control

1) **Training.** The Contractor shall provide training to all employees on effective FOD management. Training shall include description and consequences of FOD, FOD awareness, and housekeeping procedures.
2) **Housekeeping.** Preventing FOD from occurring is the most effective form of FOD management. Contractor must monitor construction activities and proactively develop a plan to prevent FOD from occurring. Typical FOD prevention measures include the use of covered trash containers, covered loads, zero tolerance of littering, and tying down items which may be easily wind-blown.
3) **Ground Vehicle Tire Inspections.** Prior to crossing active airfield pavement, the Contractor must perform a vehicle tire check for any loose rocks that may be in the tread. Tires covered in mud must be cleaned prior to crossing active pavement to prevent tracking of dirt.
4) **Pavement Sweeps.** Prior to opening sections of pavement within a work area to aircraft traffic, the Contractor will be required to sweep the entire pavement surface (including shoulders). Metal bristled brooms are known to create FOD, and the Contractor will be required to clean all bristles from the pavement. Compressed air and vacuums can be used to clean pavement surfaces as well.

8. Hazardous Materials (HAZMAT) Management

The requirements of the hazardous waste regulations established by the USEPA are presented in 40 CFR 261 through 270. Wastes that are hazardous and regulated under RCRA are classified as either listed or characteristic wastes.

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also require special procedures. See AC 150/5320-15, Management of Airport Industrial Waste.

- The Contractor is required to have a spill kit capable of containing and removing leaked fluids.
- Construction vehicles may only be refueled within the staging areas.

9. Notification of Construction Activities

A. List of Responsible Representatives

The Contractor and all sub-contractors shall designate a primary representative and an alternative to be available for contact on a 24-hour basis should the need arise. Airport notification procedures will be an agenda item at the Pre-Construction Conference.

B. NOTAMs

A "Notice to Air Mission" (NOTAM) system provides essential information to personnel concerned with flight and airport operations. NOTAMs provide timely information on unanticipated or temporary changes to components of or hazards in the National Airspace System (NAS) which includes the closure of runways or taxiways. The construction of this project will require a NOTAM to be issued. A minimum of 72 hours written notice of requested closing shall be directed to the Town of Elizabethtown who will then coordinate the request with the Department of Operations. A sample NOTAM form can be found in Appendix C (part of FAA AC 150/5200-28G). Only the FAA may issue or cancel NOTAMS on shutdown or irregular operation of FAA owned facilities.

The Owner will coordinate and issue NOTAMs to reflect construction related impacts. NOTAMs are to be kept current and reflect the actual conditions with respect to construction situations. Active NOTAMs will be reviewed periodically and revised to reflect the current conditions.

C. Emergency Notification Procedures

In the event of a life-threatening emergency, the Contractor shall call 911, then notify Airport Operations and the Engineer.

Airport FBO (operated by Sovereign Aerospace, contact Ken Hadaway): 910-862-4522

WK Dickson & Co., Inc. (Raleigh Office): 919-782-0495

D. Coordination with Aircraft Rescue & Fire Fighting (ARFF) or Fire Department

There are no on-site ARFF services provided by EYF FBO.

While it is not anticipated that the construction activities will impact emergency access routes to the airfield, it is the responsibility of the Contractor to coordinate and notify the Town of Elizabethtown Fire Department (FD) to mitigate any such potential impacts. The Contractor shall notify FD personnel of the following as necessary:

- Deactivation/reactivation of water lines of fire hydrants,
- Rerouting, blocking and restoration of emergency access routes as necessary, and
- Use of hazardous materials on the airfield.

E. Notification to FAA

FAA Form 7460-1, Notice of Proposed Construction or Alteration will be submitted to the FAA by the Engineer for review and approval. If the Contractor wishes to erect an on-site concrete plant, they shall be responsible for submitting the proper 7460-1 notification to FAA through the oeaaa.faa.gov website.

10. Inspection Requirements

A. FOD Inspection

The Contractor shall keep the project site and vehicles clean, employing a "clean as you go" approach throughout the project. At a minimum, Contractor shall conduct daily inspection to ensure all work areas are clean.

B. Airport Operations Daily Inspection

Airport Operations personnel conduct daily airfield inspections as required. These inspections include an inspection of all airfield-paved areas and safety areas. Operations will perform additional construction inspections as required.

C. Contractor Inspection

Pavements must be free of all dirt, sand, gravel, wire bristles or any other objects that could cause damage to aircraft engines. All soil areas must be free of dirt clods, ruts, or surface irregularities that could damage an aircraft should it leave the pavement.

11. Underground Utilities

1) Any utilities or facilities damaged during the project by the Contractor's workers or equipment shall be promptly repaired at the Contractor's expense by the end of the working day. Hand digging to protect utilities from damage should be anticipated.

2) The Contractor shall locate and protect existing utilities and facilities (airport lighting, NAVAIDS, etc.) from damage by equipment or personnel. The Contractor shall coordinate with the owner for proper notification to FAA facilities, the airport management, and utility companies when working in areas containing FAA or airfield lighting cable or underground cable. The Contractor shall contact all utility and facility agencies for field marking prior to beginning construction. The Contractor shall notify the owner/FAA at least (5) five days prior to ground disturbance in areas containing FAA cables. The locations of existing underground utilities are shown in an approximate way only and have not been independently verified by the owner or its representative. The Contractor shall determine the exact location of all existing utilities before commencing work and agrees to be fully responsible for all damages which might be occasioned by the underground utilities. All utilities and facilities are not necessarily shown.

3) The Contractor shall immediately contact Airport FBO (910-862-4522), and the respective utility company, if any utilities are affected.

12. Penalties

Contractor non-compliance with any of the provisions of the Construction Safety Plan, OSHA Construction Safety Standards, or any other rules and regulations defined by the Owner shall be grounds for suspension of work, rescission of driving privileges and/or immediate and permanent removal of Contractor personnel from the Airport property. Individuals who violate airport security rules may be subject to prosecution. The TSA can levy fines of up to $11,000 per security incident.

13. Special Conditions

Aircraft operations take precedence over all work, especially if a question of safety is involved.

A. Aircraft in Distress

The Airport FBO, the Resident Project Representative (RPR), and/or the Contractor superintendent will immediately clear all construction personnel of all runways and approach areas upon monitoring a distress call on Common Traffic Advisory Frequency (CTAF).

B. Aircraft Accident

All construction personnel will immediately vacate airport property and remain off until cleared by the director of operations.

C. Vehicle/Pedestrian Deviation (V/PD)

The Airport FBO may temporarily suspend construction on the AOA in the event of a non-construction related V/PD.

14. Runway & Taxiway Visual Aids

This includes marking, lighting, signs, and visual NAVAIDs. The Contractor must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways and taxiways. Throughout the duration of the construction, the Contractor shall verify that these areas always remain clearly marked and visible and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary.

A. General

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, and other wind currents and constructed of materials that will

minimize damage to an aircraft in the event of inadvertent contact. Items used to secure such markings must be of a color similar to the marking.

Airport markings, lighting, signs, and visual NAVAIDS directing aircraft to closed areas of the airport will be covered, removed, or disabled during construction.

B. Markings

Temporary pavement markings and temporary obliteration of markings will not be required during construction. Lighted barricades shall be used to designate closed taxiways. Lighted barricades will be placed as shown on Sheet C102 Construction Safety and Phasing Plan.

When temporary markings are placed on finish grade pavements, these shall be placed to mirror the dimensions of the final, permanent markings. All markings shall follow FAA AC 150/5340-1, Standards for Airport Markings.

C. Lighting & Signs

The runway, taxiways, and aprons are not anticipated to be closed for this construction.

If runway closure becomes necessary, the Contractor must notify the Airport FBO and the Engineer accordingly. For any runway closure, lighted Xs will be placed at each end of the runway or near the runway designation numbers and will be used both day and night.

Temporary construction signs are not proposed for this project. Instead, lighted barricades will be installed and maintained throughout the construction to restrict movement in the closed portion of Taxiway A3.

15. Marking & Signs for Access Routes

No temporary pavement markings or sign installation for access routes or construction information is anticipated as part of this project.

16. Hazard Marking, Lighting, & Signing

Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft and prevent construction personnel from entering areas open to aircraft. Prominent and comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles must be installed and maintained by the Contractor for the duration of construction operations. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. The need to identify less obvious construction-related hazards shall be considered during mobilization. If needed, markings and/or signage shall be erected to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for Contractor personnel to avoid these areas.

Low profile barricades of the type detailed in the project drawings shall be placed as specified on the Construction Safety and Phasing Plan. The selection for this type of barricade considered which equipment would pose the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash, and jet blast. Barricade spacing shall be such that a breach is physically prevented barring a deliberate act. The Contractor shall have a person on-call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The Contractor must file the contact person's information with the Airport. Barricade lighting should be checked for proper operation at least once per day, preferably at dusk.

Barricade lights must be red, either steady burning or flashing, and must meet the luminance requirements of the FAA and State Highway Department. Lights must be mounted on barricades and spaced at no more than 10-feet. Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the Contractor turn them on manually during periods of low visibility during daytime hours.

17. Work Zone Lighting for Nighttime Construction

It is not anticipated to have any nighttime work with this project. If it proposed to change this plan, the Contractor must contact the Engineer and Airport FBO to coordinate.

18. Protection of Runway & Taxiway Safety Areas

a) Safety area encroachments, improper ground vehicle operations and unmarked or uncovered holes and trenches in the vicinity of aircraft operation surfaces and construction areas are the three most recurring threats to safety during construction. Protection of taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces shall be a standing requirement for the duration of construction operations.
b) No work is to be conducted within the TSA while the taxiways are open for aircraft operations (see Table 4 Airfield Safety Areas).
c) No work is to be conducted within the RSA while the runway is open for aircraft operations (see Table 4 Airfield Safety Areas).
d) Open trenches and excavations are not permitted within the Safety Areas while the runway or taxiway is open. All trenches and excavations must be backfilled prior to opening the runway or taxiway.
e) Contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of reduced visibility or darkness.
f) Stockpiled material will not be permitted within active runway and taxiway object free areas.

g) **Erosion Control.** Soil erosion must be controlled to maintain TSA and RSA standards, that is, the TSA and RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire-fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

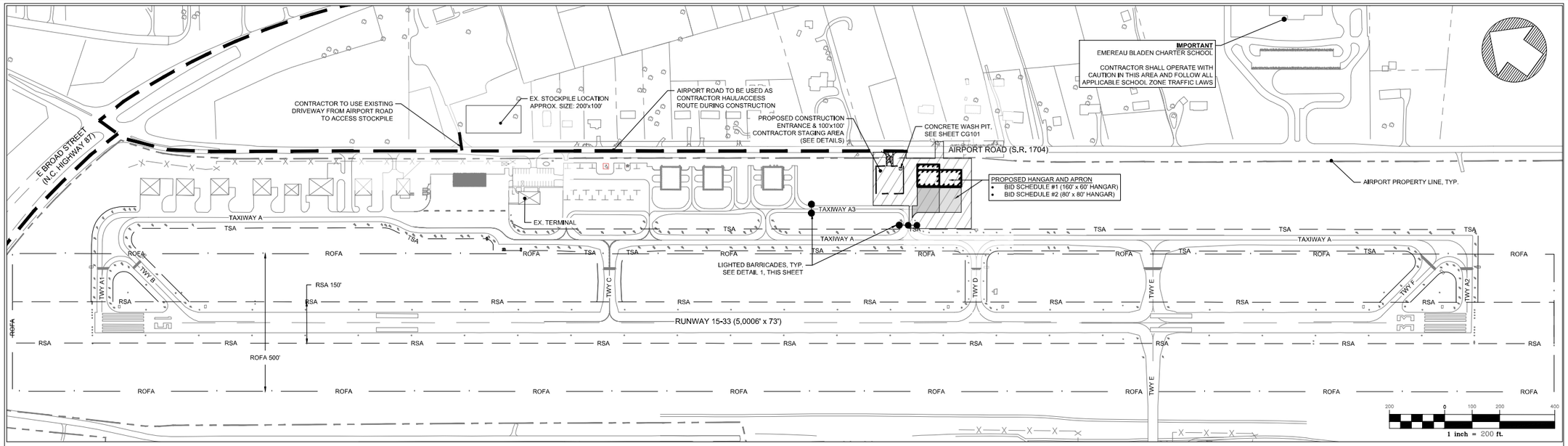
Table 4 Airfield Safety Areas

Safety Area	Total Width	Width (either side of centerline)
Runway Safety Area (RSA)	150′	75′
Runway Object Free Area (ROFA)	500′	250′
Taxiway Safety Area (TSA)	79′	39.5′
Taxiway Object Free Area (TOFA)	124′	62′
Taxilane Object Free Area (TLOFA)	110′	55′

19. Other Limitations on Construction

a) No Use of Tall Equipment. The tallest anticipated equipment used on this project will be a fully extended dump truck of approximately 25-feet. If a concrete boom pump is used during the hangar building concrete slab pour, it is estimated to be a height of 35 feet (fully extended). The use of this equipment will be accounted for in the online FAA OE/AAA 7460-1 submission.
b) Use of open flame welding or torches is not allowed, unless fire safety precautions are provided, and the airport operator has approved their use.
c) Burning of materials will not be allowed on the project site.
d) No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property (see AC 150/5370-10).

Appendix A
Construction Safety & Phasing Plan and Exhibits



LEGEND

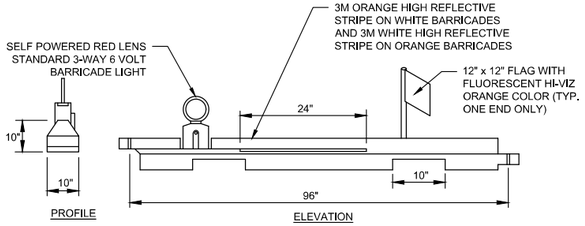
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- EXISTING FENCE LINE
- PARCEL LINE
- AIRPORT PROPERTY LINE
- CONTRACTOR HAUL ROUTE
- LIGHTED BARRICADES
- PROPOSED WORK AREA/LIMITS OF DISTURBANCE

AIRFIELD SAFETY AREAS

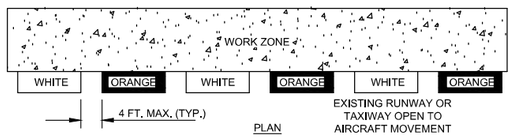
SAFETY AREA	TOTAL WIDTH	WIDTH (EITHER SIDE OF CL)
RUNWAY SAFETY AREA (RSA)	150'-0"	75'-0"
RUNWAY OBJECT FREE AREA (ROFA)	500'-0"	250'-0"
TAXIWAY SAFETY AREA (TSA)	79'-0"	39'-6"
TAXIWAY OBJECT FREE AREA (TOFA)	124'-0"	62'-0"

FIXED BASE OPERATOR (FBO) CONTACT:

AIRPORT MANAGER
KEN HADAWAY, SOVEREIGN AEROSPACE
PHONE: 910-862-4522
UNICOM RADIO FREQUENCY: 122.80



LOW PROFILE BARRICADE DETAIL
NOT TO SCALE



BARRICADE PLACEMENT DETAIL
NOT TO SCALE

BARRICADE NOTES:
1. BARRICADE CONSTRUCTION OF HIGH IMPACT, UV-RESISTANT POLYETHYLENE.
2. EACH UNIT SHALL INCLUDE TWO RED STANDARD 3-WAY LIGHT, 12-INCH ORANGE FLAG AND 3M HIGH REFLECTIVE TAPE.
3. BARRICADES SHALL BE PLACED AS SHOWN UNLESS OTHERWISE DIRECTED BY THE RESIDENT ENGINEER.
4. CONTRACTORS SHALL FILL BARRICADES WITH WATER, SAND BAGS, OR OTHER MATERIAL ACCEPTABLE TO THE OWNER TO PREVENT OVERTURNING FROM JET BLAST AND WIND GUSTS.
5. PAYMENT FOR THIS ITEM SHALL BE INCIDENTAL TO "MOBILIZATION". PAY ITEM SHALL INCLUDE BULB REPLACEMENT AND MAINTENANCE FOR PROJECT DURATION.
6. SPACING BETWEEN SEPARATE BARRICADES SHALL HAVE NO MORE THAN 10' SEPARATION.

1 / G101 LOW PROFILE LIGHTED BARRICADE DETAIL
NOT TO SCALE

SAFETY & SECURITY NOTES:

THE AIRPORT WILL BE OPEN TO AIRCRAFT TRAFFIC AT ALL TIMES DURING CONSTRUCTION UNLESS OTHERWISE NOTED. A PORTION OF TAXIWAY A3, AS SHOWN ON THIS CSPP, WILL BE CLOSED DURING CONSTRUCTION.

CONTRACTOR SHALL MONITOR UNICOM FREQUENCY: 122.80
CONTACT NUMBER: 910-862-4522

1. THE CONTRACTOR SHALL PROVIDE AT LEAST 72 HOURS NOTICE TO THE OWNER BEFORE ACCESSING THE WORK AREA UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL GIVE WAY TO AIRCRAFT AT ALL TIMES.
3. THE CONTRACTOR SHALL COORDINATE AND MANAGE INGRESS-EGRESS LOCATIONS WITH THE OWNER. ALL GATES TO SECURED AIRPORT AREAS SHALL BE CONTROLLED IN ACCORDANCE WITH THE OWNERS REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL GATES AT THE END OF EACH DAY'S OPERATIONS.
4. ALL CONSTRUCTION VEHICLES MUST BE CLEARED FOR ACCESS BY THE OWNER. ALL VEHICLES OPERATING IN ACTIVE AIR OPERATION AREAS SHALL BE MARKED AND LIGHTED IN ACCORDANCE WITH FAA ADVISORY CIRCULAR 150/5210-5D.
5. THE CONTRACTOR SHALL PROVIDE STRICT SECURITY FOR ALL PERSONNEL AT THE SITE AND TO TRUCK DRIVERS HAULING MATERIALS AND EQUIPMENT. ANYONE FOUND IN RESTRICTED AREAS OR CROSSING ACTIVE RUNWAYS, TAXIWAYS, AND RAMPS, WILL BE PROMPTLY AND PERMANENTLY REMOVED FROM THE JOB.
6. AT NO TIME WILL THE CONTRACTOR'S PERSONNEL OR EQUIPMENT BE ALLOWED IN THE TERMINAL OR AIRCRAFT PARKING RAMP AREAS .
7. THE CONTRACTOR SHALL PROVIDE FOR EMPLOYEE PARKING WITHIN OR ADJACENT TO HIS STAGING AREA. ONLY AUTHORIZED VEHICLES WILL BE ALLOWED INSIDE THE SECURITY FENCE. AT THE END OF EACH WORK DAY, THE CONTRACTOR SHALL POSITION ALL EQUIPMENT, TOOLS, MATERIAL, ETC. IN THE APPROVED STAGING AREA UNLESS OTHERWISE REQUESTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
8. EQUIPMENT NOT IN USE SHALL BE PARKED IN THE CONTRACTOR'S STAGING AREA OR IN AREAS DESIGNATED BY THE ENGINEER. IDLE EQUIPMENT NOT REQUIRED FOR THIS PROJECT SHALL NOT BE STORED ON AIRPORT PROPERTY.
9. BARRICADES AND GATE CONTROL SHALL BE PROVIDED BY THE CONTRACTOR AND WILL BE INCIDENTAL TO THE MOBILIZATION ITEM OF WORK. AT THE CLOSE OF THE PROJECT, BARRICADES SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.
10. PROJECT ACCESS LOCATION(S), HAUL ROUTES AND STAGING AREA(S) SHALL BE COORDINATED WITH THE OWNER. THESE AREAS SHALL BE AVAILABLE TO THE CONTRACTOR FOR THE DURATION OF THE PROJECT, UNLESS OTHERWISE NOTED.
11. THE CONTRACTOR WILL HAVE ACCESS TO THE EXISTING STOCKPILE (SHOWN ON THIS CSPP) FOR "EMBANKMENT IN PLACE" MATERIAL DESIGNATED FOR USE ON THE PROJECT. COORDINATION WITH THE OWNER AND ENGINEER IS REQUIRED TO ACCESS THIS STOCKPILE.
12. WORK INVOLVING ACCESS TO THE AIRPORT SHALL CONFORM TO THE REQUIREMENTS OF THE N.C.D.O.T. "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" LATEST VERSION. THE CONTRACTORS SHALL PROVIDE THE REQUIRED WARNING DEVICES, FLAG MEN, ETC. FOR TRAFFIC CONTROL.
13. ALL REQUIREMENTS OF FAA ADVISORY CIRCULAR 150/5370-2 LATEST VERSION, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION" SHALL BE FOLLOWED DURING CONSTRUCTION.
14. IF THERE IS A MEDICAL EMERGENCY, CALL 911 THEN THE AIRPORT FBO AT 910-862-4522

PHASING & CONTRACT TIME GENERAL NOTES

1. THE BID SCHEDULE WORK SHALL BE COMPLETED WITHIN THE ALLOTTED TIME NOTED HERE AND WITHIN THE PROJECT CONTRACT. THE TOTAL NUMBER OF CONTRACT DAYS FOR THIS PROJECT DEPENDS ON SELECTED BID SCHEDULE.

   BID SCHEDULES & CONTRACT DURATION:
   - BID SCHEDULE #1 (160' x 60' HANGAR): 180 CONSECUTIVE CALENDAR DAYS
   - BID SCHEDULE #2 (80' x 80' HANGAR): 130 CONSECUTIVE CALENDAR DAYS
2. LIQUIDATED DAMAGES FOR CONTRACT TIME OVERRUN = $1,000/CALENDAR DAYS
3. A PORTION OF EXISTING TAXIWAY A3 AS SHOWN ON THIS CSPP SHALL BE CLOSED FOR THE DURATION OF THE PROJECT.
4. THERE IS NO NIGHTTIME WORK UNLESS OTHERWISE AGREED UPON BY OWNER AND ENGINEER. OTHER THAN THIS, THERE ARE NO OTHER WORK HOUR RESTRICTIONS.
5. CONTRACTOR SHALL MAINTAIN BARRIERS AT ALL TIMES SO AS NOT TO ALLOW ACCESS TO CLOSED AREAS.
6. FOR SURVEY BENCHMARK INFORMATION, REFER TO THE SURVEY COMPLETED BY STEWART, INC. DATED 12/19/2024 (INCLUDED WITH THIS PLAN SET, SHEET SU101)
7. CONSTRUCTION TRAFFIC WILL NOT BE ALLOWED WITHIN THE RUNWAY OBJECT AREA (ROFA) OR RUNWAY SAFETY AREA (RSA) OR ON TAXIWAY A. ACCESS TO TAXIWAY A3 SHALL BE LIMITED TO MOBILIZATION/CLEAN-UP AND FOR THE TIE-IN TO TAXIWAY A3 PAVEMENT.

PHASING PLAN

- INSTALL EROSION CONTROL MEASURES, CONSTRUCTION ENTRANCES, CONTRACTOR STAGING AREA, HAUL ROUTES, NEW VEHICLE GATE, AND LIGHTED BARRICADES
- PERFORM WORK GENERALLY AS OUTLINED BELOW
- UPON COMPLETION OF PROJECT, REMOVE BARRICADES. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL STABILIZATION HAS BEEN ACHIEVED.
- A PORTION OF EXISTING TAXIWAY A3, AS SHOWN ON THIS CSPP, WILL BE CLOSED FOR THE DURATION OF THE PROJECT

	WORK DESCRIPTION	PHASE NOTES
PHASE 1	• ISSUE NOTAM FOR CONSTRUCTION WORK ON AIRFIELD • EARTHWORK/GRADING • SUBGRADE PROOF ROLLING AND PREPARATION (APRON AND BUILDING AREAS), COMPLETE TESTING AND TOPOGRAPHIC SURVEY • FINE GRADE BUILDING PAD AREA FOR STONE AND FOUNDATION CONSTRUCTION • BUILDING CONSTRUCTION • INSTALL 6" OF P-209 BASE COURSE (APRON), COMPLETE TESTING AND TOPOGRAPHIC SURVEY • MILL EXISTING TAXIWAY A3 PAVEMENT AS NOTED ON PLANS FOR TIE-IN • INSTALL 2 x 2" LIFT OF P-401 ASPHALT SURFACE COURSE (APRON), COMPLETE TESTING AND TOPOGRAPHIC SURVEY • FINE GRADING AND STABILIZATION OF SITE • INSTALL TEMPORARY PAVEMENT MARKINGS PER PLANS • REMOVE LIGHTED BARRICADES, OPEN APRON AND CLOSED PORTION OF TAXIWAY A3	DAYTIME WORK NO NIGHT TIME WORK UNLESS APPROVED BY ENGINEER AND OWNER
PHASE 2	PAVEMENT MARKINGS (PERMANENT) • ISSUE NOTAM AND INSTALL LIGHTED BARRICADES • INSTALL PERMANENT PAVEMENT MARKINGS 30-DAYS AFTER COMPLETION OF PAVEMENT INSTALL • REMOVE LIGHTED BARRICADES, OPEN APRON AND CLOSED PORTION OF TAXIWAY A3	DAYTIME WORK

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NC LICENSE NO. F-0374

PROFESSIONAL SEAL

REVISION RECORD

NO.	DESCRIPTION	BY	DATE

ISSUED FOR BIDDING (NOT RELEASED FOR CONSTRUCTION)

PROJECT NAME: MULTI-UNIT HANGAR DEVELOPMENT, PHASE 1 FOR TOWN OF ELIZABETHTOWN

DRAWING TITLE: **CONSTRUCTION SAFETY AND PHASING PLAN**

PROJ. MGR.:	JP
DESIGN BY:	AEC/MWC
DRAWN BY:	AEC/MWC
PROJ. DATE:	FEB 2025

DRAWING NUMBER: G101

WKD PROJ. NO.: 2024074400WK

Appendix B
FAA AC 150/5370-2G Operational Safety on Airports During Construction

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Operational Safety on Airports During Construction	**Date:** 12/13/2017 **Initiated By:** AAS-100	**AC No:** 150/5370-2G **Change:**

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction*, dated September 29, 2011.

3 **Application.**

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. Appendix A contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

5 **Principal Changes.**

The AC incorporates the following principal changes:

1. Notification about impacts to both airport owned and FAA-owned NAVAIDs was added. See paragraph 2.13.5.3, NAVAIDs.

2. Guidance for the use of orange construction signs was added. See paragraph 2.18.4.2, Temporary Signs.
3. Open trenches or excavations may be permitted in the taxiway safety area while the taxiway is open to aircraft operations, subject to restrictions. See paragraph 2.22.3.4, Excavations.
4. Guidance for temporary shortened runways and displaced thresholds has been enhanced. See Figure 2-1 and Figure 2-2.
5. Figures have been improved and a new Appendix F on the placement of orange construction signs has been added.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the "ALT" and " ←" keys simultaneously.

Figures in this document are schematic representations and are not to scale.

6 **Use of Metrics.**

Throughout this AC, U.S. customary units are used followed with "soft" (rounded) conversion to metric units. The U.S. customary units govern.

7 **Where to Find this AC.**

You can view a list of all ACs at http://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at http://www.faa.gov/regulations_policies/faa_regulations/.

8 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.

John R. Dermody
Director of Airport Safety and Standards

CONTENTS

Paragraph **Page**

FIGURES

Number **Page**

TABLES

Number **Page**

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CHAPTER 1. PLANNING AN AIRFIELD CONSTRUCTION PROJECT

1.1 Overview.

Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

1.2 Plan for Safety.

Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified and their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

1.2.1 Identify Affected Areas.

The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

1.2.2 Describe Current Operations.

Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the airplanes that operate on each runway; the ADG and Taxiway Design Group (TDG)[1] for each affected taxiway; designated approach visibility minimums;

[1] Find Taxiway Design Group information in AC 150/5300-13, *Airport Design.*

available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System (SMGCS) plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

1.2.3 Allow for Temporary Changes to Operations.

To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways, and other changes. An example of a table showing temporary operations versus current operations is shown in Appendix E.

1.2.4 Take Required Measures to Revise Operations.

Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary widely among airports, this AC presents general guidance on those subjects.

1.2.5 Manage Safety Risk.

The FAA is committed to incorporating proactive safety risk management (SRM) tools into its decision-making processes. FAA Order 5200.11, *FAA Airports (ARP) Safety Management System (SMS)*, requires the FAA to conduct a Safety Assessment for certain triggering actions. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA determine whether a Safety Assessment is required prior to FAA approval of the CSPP. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for a Safety Risk Assessment. If the FAA requires an assessment, the airport operator must at a minimum:

1. Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.
2. Provide documents identified by the FAA as necessary to conduct SRM.
3. Participate in the SRM process for airport projects.
4. Provide a representative to participate on the SRM panel.

5. Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

1.3 **Develop a Construction Safety and Phasing Plan (CSPP).**

Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix A for a list of related reading material.

1.3.1 List Requirements.

A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or located on an airport certificated under Part 139. For on-airfield construction projects at Part 139 airports funded without AIP funds, the preparation of a CSPP represents an acceptable method the certificate holder may use to meet Part 139 requirements during airfield construction activity. As per FAA Order 5200.11, projects that require Safety Assessments do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 1.2.5).

1.3.2 Prepare a Safety Plan Compliance Document (SPCD).

The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

1.3.3 Assume Responsibility for the CSPP.

The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

1.4 Who Is Responsible for Safety During Construction?

1.4.1 Establish a Safety Culture.

Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others, such as military personnel at any airport supporting military operations (e.g. national guard or a joint use facility). Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

1.4.2 Assess Airport Operator's Responsibilities.

An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

1.4.2.1 Develop a CSPP that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.

1.4.2.2 Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.

1.4.2.3 Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5370-12, *Quality Management for Federally Funded Airport Construction Projects.* (Note "FAA" refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)

1.4.2.4 Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.

1.4.2.5 Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.

1.4.2.6 Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.

1.4.2.7 Ensure construction personnel know applicable airport procedures and changes to those procedures that may affect their work.

1.4.2.8 Ensure that all temporary construction signs are located per the scheduled list for each phase of the project.

1.4.2.9 Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.

1.4.2.10 Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.

1.4.2.11 At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

1.4.2.12 Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

1.4.2.13 Take immediate action to resolve safety deficiencies.

1.4.2.14 At airports subject to 49 CFR Part 1542, *Airport Security*, ensure construction access complies with the security requirements of that regulation.

1.4.2.15 Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).

1.4.2.16 Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.

1.4.2.17 Ensure prompt transmission of the Airport Sponsor Strategic Event Submission, FAA Form 6000-26, located at https://oeaaa.faa.gov/oeaaa/external/content/AIRPORT_SPONSOR_STRATEGIC_EVENT_SUBMISSION_FORM.pdf, to assure proper coordination for NAS Strategic Interruption per Service Level Agreement with ATO.

1.4.2.18 Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. The FAA Airports Regional or District office will determine if further coordination within the FAA is needed. Coordinate with appropriate local and other federal government agencies, such as Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Transportation Security Administration (TSA), and the state environmental agency.

1.4.3 Define Construction Contractor's Responsibilities.

The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

1.4.3.1 Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supply any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor, indicating an understanding of the operational safety requirements of the CSPP and the assertion of compliance with the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.

1.4.3.2 Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

1.4.3.3 Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.

1.4.3.4 Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.

1.4.3.5 Conduct sufficient inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

1.4.3.6 Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.

1.4.3.7 Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.

1.4.3.8 Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

1.4.3.9 Ensure that all necessary safety mitigations are understood by all parties involved, and any special requirements of each construction phase will be fulfilled per the approved timeframe.

1.4.3.10 Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

1.4.4 Define Tenant's Responsibilities.

If planning construction activities on leased property, Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction are strongly encouraged to:

1. Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator. The airport operator may forgo a complete CSPP submittal and instead incorporate appropriate operational safety principles and measures addressed in the advisory circular within their tenant lease agreements.
2. In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval issued prior to issuance of a Notice to Proceed.
3. Ensure that construction personnel are familiar with safety procedures and regulations on the airport during all phases of the construction.
4. Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
5. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
6. Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.
7. Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, as specified in the CSPP and SPCD.
8. Ensure prompt submittal through the airport operator of Form 7460-1 for conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.
9. Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

CHAPTER 2. CONSTRUCTION SAFETY AND PHASING PLANS

2.1 Overview.

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

2.2 Assume Responsibility.

Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

2.3 Submit the CSPP.

Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5 × 11 inch or 11 × 17 inch format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

2.3.1 Submit an Outline/Draft.

By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

2.3.2 Submit a CSPP.

The CSPP should be formally submitted for FAA approval when the project design is 80 percent to 90 percent complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

2.3.3 Submit an SPCD.

The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

2.3.4 Submit CSPP Revisions.

All revisions to a previously approved CSPP must be re-submitted to the FAA for review and approval/disapproval action.

2.4 Meet CSPP Requirements.

2.4.1 To the extent possible, the CSPP should address the following as outlined in Chapter 3, Guidelines for Writing a CSPP. Details that cannot be determined at this stage are to be included in the SPCD.

1. Coordination.
    a. Contractor progress meetings.
    b. Scope or schedule changes.
    c. FAA ATO coordination.
2. Phasing.
    a. Phase elements.
    b. Construction safety drawings.
3. Areas and operations affected by the construction activity.
    a. Identification of affected areas.
    b. Mitigation of effects.
4. Protection of navigation aids (NAVAIDs).
5. Contractor access.
    a. Location of stockpiled construction materials.
    b. Vehicle and pedestrian operations.
6. Wildlife management.
    a. Trash.
    b. Standing water.
    c. Tall grass and seeds.
    d. Poorly maintained fencing and gates.
    e. Disruption of existing wildlife habitat.
7. Foreign Object Debris (FOD) management.
8. Hazardous materials (HAZMAT) management.
9. Notification of construction activities.

a. Maintenance of a list of responsible representatives/ points of contact.

b. NOTAM.

c. Emergency notification procedures.

d. Coordination with ARFF Personnel.

e. Notification to the FAA.

10. Inspection requirements.

a. Daily (or more frequent) inspections.

b. Final inspections.

11. Underground utilities.

12. Penalties.

13. Special conditions.

14. Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.

a. General.

b. Markings.

c. Lighting and visual NAVAIDs.

d. Signs, temporary, including orange construction signs, and permanent signs.

15. Marking and signs for access routes.

16. Hazard marking and lighting.

a. Purpose.

b. Equipment.

17. Work zone lighting for nighttime construction (if applicable).

18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces.

a. Runway Safety Area (RSA).

b. Runway Object Free Area (ROFA).

c. Taxiway Safety Area (TSA). Provide details for any adjustments to Taxiway Safety Area width to allow continued operation of smaller aircraft. See paragraph 2.22.3.

d. Taxiway Object Free Area (TOFA). Provide details for any continued aircraft operations while construction occurs within the TOFA. See paragraph 2.22.4.

e. Obstacle Free Zone (OFZ).

f. Runway approach/departure surfaces.

19. Other limitations on construction.

a. Prohibitions.

b. Restrictions.

2.4.2 The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, approved on (Date), and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

1. Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
2. Phasing. Discuss proposed construction schedule elements, including:
   a. Duration of each phase.
   b. Daily start and finish of construction, including "night only" construction.
   c. Duration of construction activities during:
      i. Normal runway operations.
      ii. Closed runway operations.
      iii. Modified runway "Aircraft Reference Code" usage.
3. Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.
4. Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.
5. Contractor access. Provide the following:
   a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
   b. Listing of individuals requiring driver training (for certificated airports and as requested).
   c. Radio communications.
      i. Types of radios and backup capabilities.
      ii. Who will be monitoring radios.
      iii. Who to contact if the ATCT cannot reach the contractor's designated person by radio.

d. Details on how the contractor will escort material delivery vehicles.

6. Wildlife management. Discuss the following:
   a. Methods and procedures to prevent wildlife attraction.
   b. Wildlife reporting procedures.
7. Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.
8. Hazardous Materials (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.
9. Notification of construction activities. Provide the following:
   a. Contractor points of contact.
   b. Contractor emergency contact.
   c. Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
   d. Batch plant details, including 7460-1 submittal.
10. Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.
11. Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.
12. Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.
13. Special conditions. Discuss proposed actions for each special condition identified in the CSPP.
14. Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
   a. Equipment and methods for covering signage and airfield lights.
   b. Equipment and methods for temporary closure markings (paint, fabric, other).
   c. Temporary orange construction signs.
   d. Types of temporary Visual Guidance Slope Indicators (VGSI).
15. Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.
16. Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.
17. Work zone lighting for nighttime construction (if applicable). Discuss proposed equipment, locations, aiming, and shielding to prevent interference with air traffic control and aircraft operations.

18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
    a. Equipment and methods for maintaining Taxiway Safety Area standards.
    b. Equipment and methods to ensure the safe passage of aircraft where Taxiway Safety Area or Taxiway Object Free Area standards cannot be maintained.
    c. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
19. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

2.5 **Coordination.**

Airport operators, or tenants responsible for design, bidding and conducting construction on their leased properties, should ensure at all project developmental stages, such as predesign, prebid, and preconstruction conferences, they capture the subject of airport operational safety during construction (see AC 150/5370-12, *Quality Management for Federally Funded Airport Construction Projects*). In addition, the following should be coordinated as required:

2.5.1 Progress Meetings.

Operational safety should be a standing agenda item for discussion during progress meetings throughout the project developmental stages.

2.5.2 Scope or Schedule Changes.

Changes in the scope or duration at any of the project stages may require revisions to the CSPP and review and approval by the airport operator and the FAA (see paragraph 1.4.2.17).

2.5.3 FAA ATO Coordination.

Early coordination with FAA ATO is highly recommended during the design phase and is required for scheduling Technical Operations shutdowns prior to construction. Coordination is critical to restarts of NAVAID services and to the establishment of any special procedures for the movement of aircraft. Formal agreements between the airport operator and appropriate FAA offices are recommended. All relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, should be coordinated with FAA ATO and may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See paragraph 2.13.5.3.2 for required FAA notification regarding FAA-owned NAVAIDs.)

2.6 **Phasing.**

Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In this case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

2.6.1 Phase Elements.

For each phase the CSPP should detail:

- Areas closed to aircraft operations.
- Duration of closures.
- Taxi routes and/or areas of reduced TSA and TOFA to reflect reduced ADG use.
- ARFF access routes.
- Construction staging, disposal, and cleanout areas.
- Construction access and haul routes.
- Impacts to NAVAIDs.
- Lighting, marking, and signing changes.
- Available runway length and/or reduced RSA and ROFA to reflect reduced ADG use.
- Declared distances (if applicable).
- Required hazard marking, lighting, and signing.
- Work zone lighting for nighttime construction (if applicable).
- Lead times for required notifications.

2.6.2 Construction Safety Drawings.

Drawings specifically indicating operational safety procedures and methods in affected areas (i.e., construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should also be included in the contract drawing package.

2.7 **Areas and Operations Affected by Construction Activity.**

Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA ATO will support operational simulations. See Appendix E for an example of a table showing temporary operations versus current operations. The tables in Appendix E can be useful for coordination among all interested parties, including FAA Lines of Business.

2.7.1 Identification of Affected Areas.

Identifying areas and operations affected by the construction helps to determine possible safety problems. The affected areas should be identified in the construction safety drawings for each construction phase. (See paragraph 2.6.2.) Of particular concern are:

2.7.1.1 **Closing, or Partial Closing, of Runways, Taxiways and Aprons, and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or takeoff in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is normally available for take-off in the direction of the displacement and for landing and takeoff in the opposite direction. Misunderstanding this difference, may result in issuance of an inaccurate NOTAM, and can lead to a hazardous condition.

2.7.1.1.1 Partially Closed Runways.

The temporarily closed portion of a partially closed runway will generally extend from the threshold to a taxiway that may be used for entering and exiting the runway. If the closed portion extends to a point between taxiways, pilots will have to back-taxi on the runway, which is an undesirable operation. See Figure 2-1 for a desirable configuration.

2.7.1.1.2 Displaced Thresholds.

Since the portion of the runway pavement between the permanent threshold and a standard displaced threshold is available for takeoff and for landing in the opposite direction, the temporary displaced threshold need not be located at an entrance/exit taxiway. See Figure 2-2.

2.7.1.2 Closing of aircraft rescue and fire fighting access routes.

2.7.1.3 Closing of access routes used by airport and airline support vehicles.

2.7.1.4 Interruption of utilities, including water supplies for fire fighting.

2.7.1.5 Approach/departure surfaces affected by heights of objects.

2.7.1.6 Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.

Figure 2-1. Temporary Partially Closed Runway

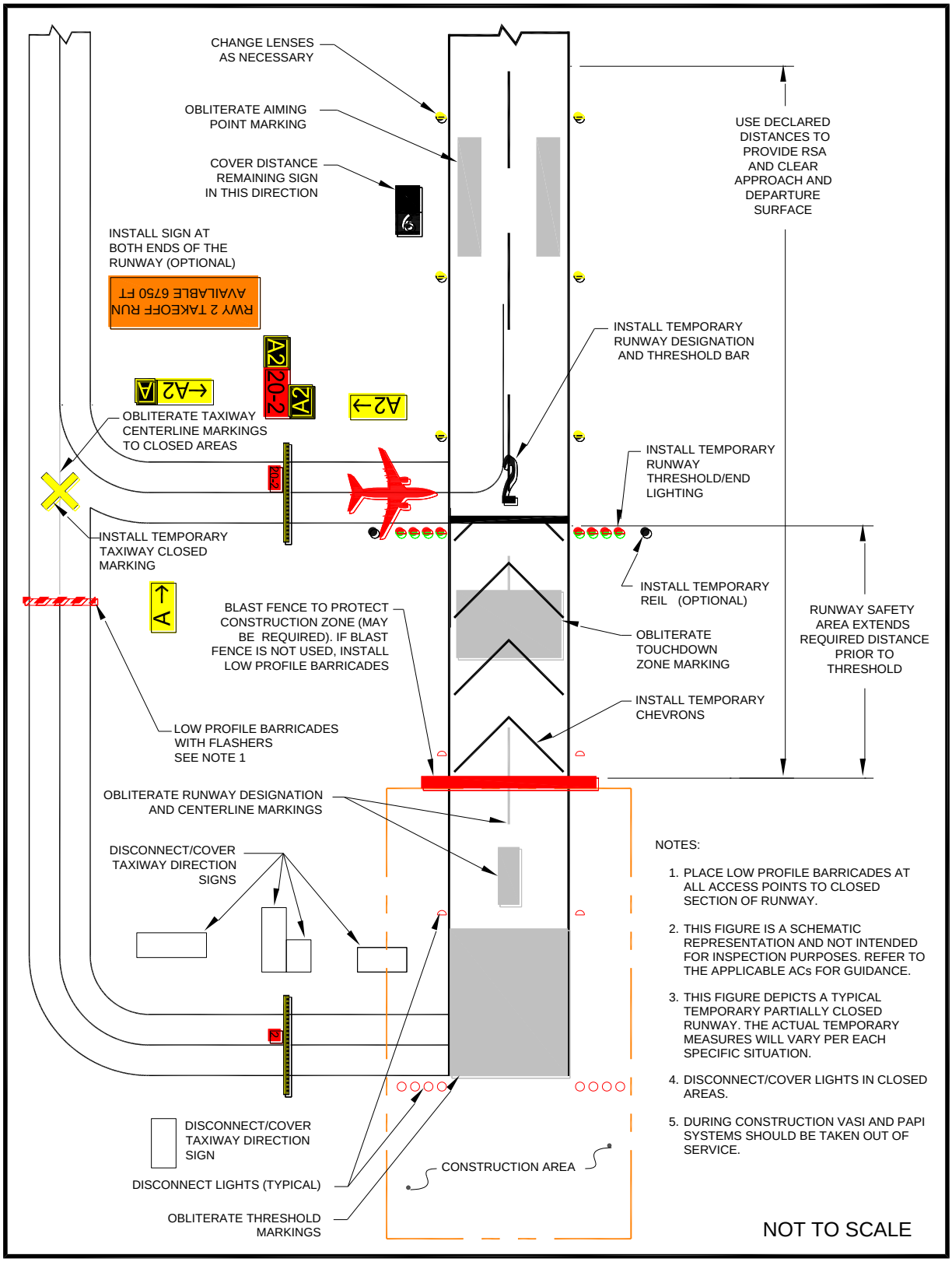
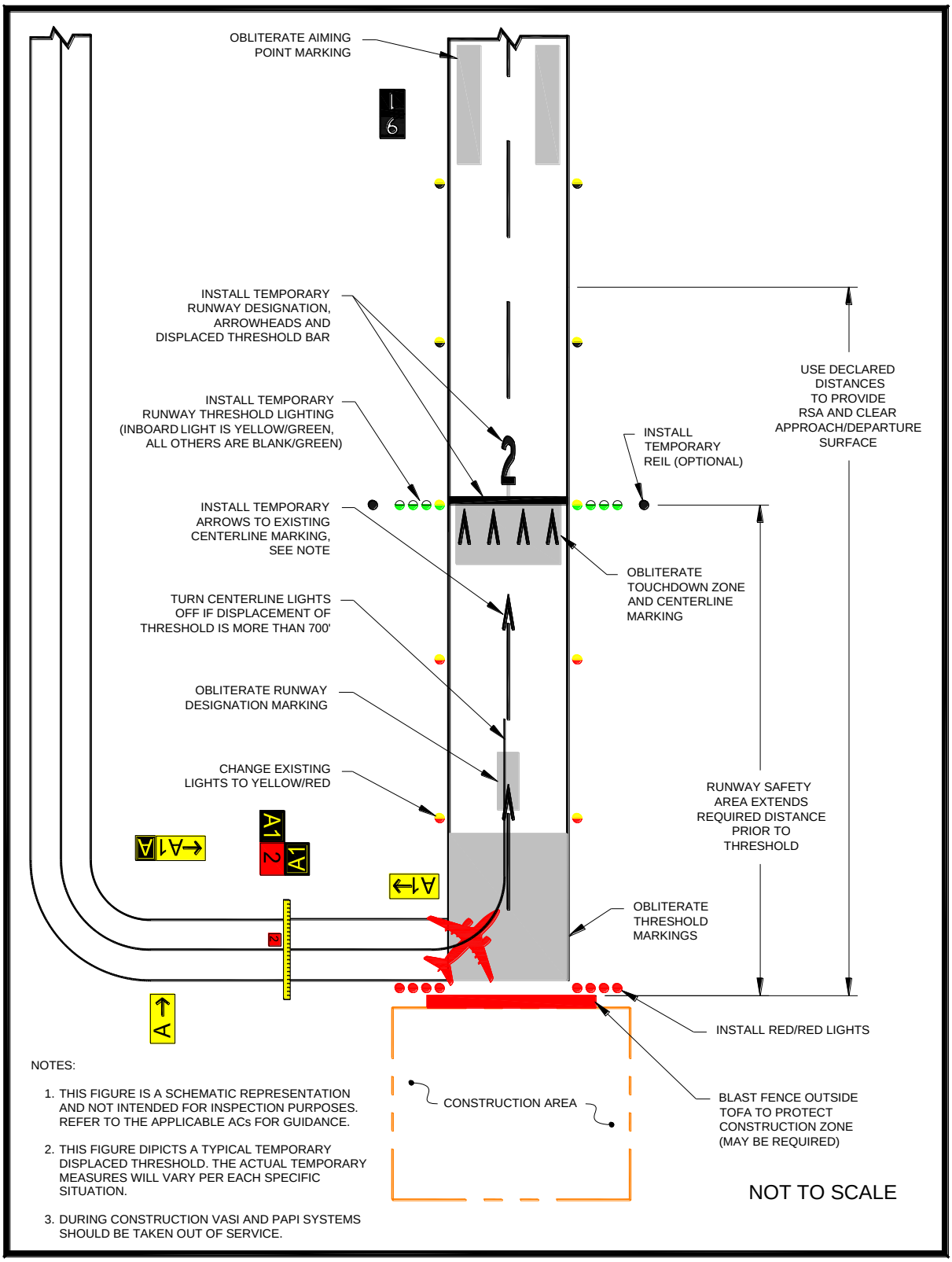


Figure 2-2. Temporary Displaced Threshold



Note: See paragraph 2.18.2.5.

2.7.2 Mitigation of Effects.

Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

2.7.2.1 Temporary changes to runway and/or taxi operations.

2.7.2.2 Detours for ARFF and other airport vehicles.

2.7.2.3 Maintenance of essential utilities.

2.7.2.4 Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

2.8 Navigation Aid (NAVAID) Protection.

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 2.13.5.3.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the "critical area" associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 2.13.2). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 2.13.5.3.)

2.9 Contractor Access.

The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

2.9.1 Location of Stockpiled Construction Materials.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 2.18.2.) This includes determining and

verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material. See paragraphs 2.10 and 2.11.

2.9.2 Vehicle and Pedestrian Operations.

The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, with associated training requirements:

2.9.2.1 **Construction Site Parking.**

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

2.9.2.2 **Construction Equipment Parking.**

Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 2.13.1 for further information.

2.9.2.3 **Access and Haul Roads.**

Determine the construction contractor’s access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul

roads does not interfere with NAVAIDs or approach surfaces of operational runways. Address whether access gates will be blocked or inoperative or if a rally point will be blocked or inaccessible.

2.9.2.4 Marking and lighting of vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport.*

2.9.2.5 Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.

2.9.2.6 Required escorts.

2.9.2.7 **Training Requirements for Vehicle Drivers to Ensure Compliance with the Airport Operator's Vehicle Rules and Regulations.**

Specific training should be provided to vehicle operators, including those providing escorts. See AC 150/5210-20, *Ground Vehicle Operations on Airports*, for information on training and records maintenance requirements.

2.9.2.8 **Situational Awareness.**

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time. At non-towered airports, all aircraft movements and flight operations rely on aircraft operators to self-report their positions and intentions. However, there is no requirement for an aircraft to have radio communications. Because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.

2.9.2.9 **Two-Way Radio Communication Procedures.**

2.9.2.9.1 General.

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

1. Airport operations
2. ATCT

3. Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.
4. Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and "shortened" runways on the ATIS frequency.

2.9.2.9.2 Areas Requiring Two-Way Radio Communication with the ATCT.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

2.9.2.9.3 Frequencies to be Used.

The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

2.9.2.9.4 Proper radio usage, including read back requirements.

2.9.2.9.5 Proper phraseology, including the International Phonetic Alphabet.

2.9.2.9.6 Light Gun Signals.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings." This safety placard may be downloaded through the Runway Safety Program Web site at http://www.faa.gov/airports/runway_safety/publications/ (see "Signs & Markings Vehicle Dashboard Sticker") or obtained from the FAA Airports Regional Office.

2.9.2.10 **Maintenance of the secured area of the airport, including:**

2.9.2.10.1 Fencing and Gates.

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-

00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

2.9.2.10.2 Badging Requirements.

Airports subject to 49 CFR Part 1542, *Airport Security*, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

2.10 Wildlife Management.

The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports,* and CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife.* Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

2.10.1 Trash.

Food scraps must be collected from construction personnel activity.

2.10.2 Standing Water.

2.10.3 Tall Grass and Seeds.

Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, *Standards for Specifying Construction of Airports,* Item T-901, Seeding. Contact the local office of the United Sates Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

2.10.4 Poorly Maintained Fencing and Gates.

See paragraph 2.9.2.10.1.

2.10.5 Disruption of Existing Wildlife Habitat.

While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

2.11 Foreign Object Debris (FOD) Management.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) or covers may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, *Foreign Object Debris (FOD) Management.*

2.12 Hazardous Materials (HAZMAT) Management.

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, *Management of Airport Industrial Waste.*

2.13 Notification of Construction Activities.

The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

2.13.1 List of Responsible Representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours.

2.13.2 NOTAMs.

Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must either enter the NOTAM into NOTAM Manager, or provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMs) for Airport Operators,* for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 2.7.1.1 about issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

2.13.3 Emergency notification procedures for medical, fire fighting, and police response.

2.13.4 Coordination with ARFF.

The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

1. The deactivation and subsequent reactivation of water lines or fire hydrants, or
2. The rerouting, blocking and restoration of emergency access routes, or
3. The use of hazardous materials on the airfield.

2.13.5 Notification to the FAA.

2.13.5.1 **Part 77.**

Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, other equipment) on airports. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix A to download the form. Further guidance is available on the FAA web site at oeaaa.faa.gov.

2.13.5.2 **Part 157.**

With some exceptions, Title 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, *Notice of Landing Area Proposal*, to the nearest FAA Airports Regional or District Office. See Appendix A to download the form.

2.13.5.3 **NAVAIDs.**

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

2.13.5.3.1 Airport Owned/FAA Maintained.

If construction operations require a shutdown of 24 hours or greater in duration, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown, using Strategic Event Coordination (SEC) Form 6000.26 contained within FAA Order 6000.15, *General Maintenance Handbook for National Airspace System (NAS) Facilities*.

2.13.5.3.2 FAA Owned.

1. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs, using SEC Form 6000.26.
2. Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. Refer to active Service Level Agreement with ATO for specifics.

2.14 **Inspection Requirements.**

2.14.1 Daily Inspections.

Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix D, Construction Project Daily Safety Inspection Checklist. See also AC 150/5200-18, *Airport Safety Self-Inspection.* Airport operators holding a Part 139 certificate are required to conduct self-inspections during unusual conditions, such as construction activities, that may affect safe air carrier operations.

2.14.2 Interim Inspections.

Inspections should be conducted of all areas to be (re)opened to aircraft traffic to ensure the proper operation of lights and signs, for correct markings, and absence of FOD. The contractor should conduct an inspection of the work area with airport operations personnel. The contractor should ensure that all construction materials have been secured, all pavement surfaces have been swept clean, all transition ramps have been properly constructed, and that surfaces have been appropriately marked for aircraft to operate safely. Only if all items on the list meet with the airport operator's approval should the air traffic control tower be notified to open the area to aircraft operations. The contractor should be required to retain a suitable workforce and the necessary equipment at the work area for any last minute cleanup that may be requested by the airport operator prior to opening the area.

2.14.3 Final Inspections.

New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

2.15 **Underground Utilities.**

The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that "One Call" or "Miss Utility" services do not include FAA ATO/Technical Operations.

2.16 **Penalties.**

The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

2.17 **Special Conditions.**

The CSPP must detail any special conditions that affect the operation of the airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

2.18 **Runway and Taxiway Visual Aids.**

This includes marking, lighting, signs, and visual NAVAIDs. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary. The CSPP must address the following, as appropriate:

2.18.1 General.

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, and other wind currents and constructed of materials that will minimize damage to an aircraft in the event of inadvertent contact. Items used to secure such markings must be of a color similar to the marking.

2.18.2 Markings.

During the course of construction projects, temporary pavement markings are often required to allow for aircraft operations during or between work periods. During the design phase of the project, the designer should coordinate with the project manager,

airport operations, airport users, the FAA Airports project manager, and Airport Certification Safety Inspector for Part 139 airports to determine minimum temporary markings. The FAA Airports project manager will, wherever a runway is closed, coordinate with the appropriate FAA Flight Standards Office and disseminate findings to all parties. Where possible, the temporary markings on finish grade pavements should be placed to mirror the dimensions of the final markings. Markings must be in compliance with the standards of AC 150/5340-1, *Standards for Airport Markings*, except as noted herein. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 2.18.2.1.2.)

2.18.2.1 **Closed Runways and Taxiways.**

2.18.2.1.1 Permanently Closed Runways.

For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place an X at each end and at 1,000-foot (300 m) intervals. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X.

2.18.2.1.2 Temporarily Closed Runways.

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X. See Figure 2-3. See also paragraph 2.18.3.3.

2.18.2.1.3 Partially Closed Runways and Displaced Thresholds.

When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 2.7.1.1 for the difference between partially closed runways and runways with displaced thresholds. Because of the temporary nature of threshold displacement due to construction, it is not necessary to re-adjust the existing runway centerline markings to meet standard spacing for a runway with a visual approach. Some of the requirements below may be waived in the cases of low-activity airports and/or short duration changes that are measured in days rather than weeks. Consider whether the presence of an airport traffic

control tower allows for the development of special procedures. Contact the appropriate FAA Airports Regional or District Office for assistance.

Figure 2-3. Markings for a Temporarily Closed Runway

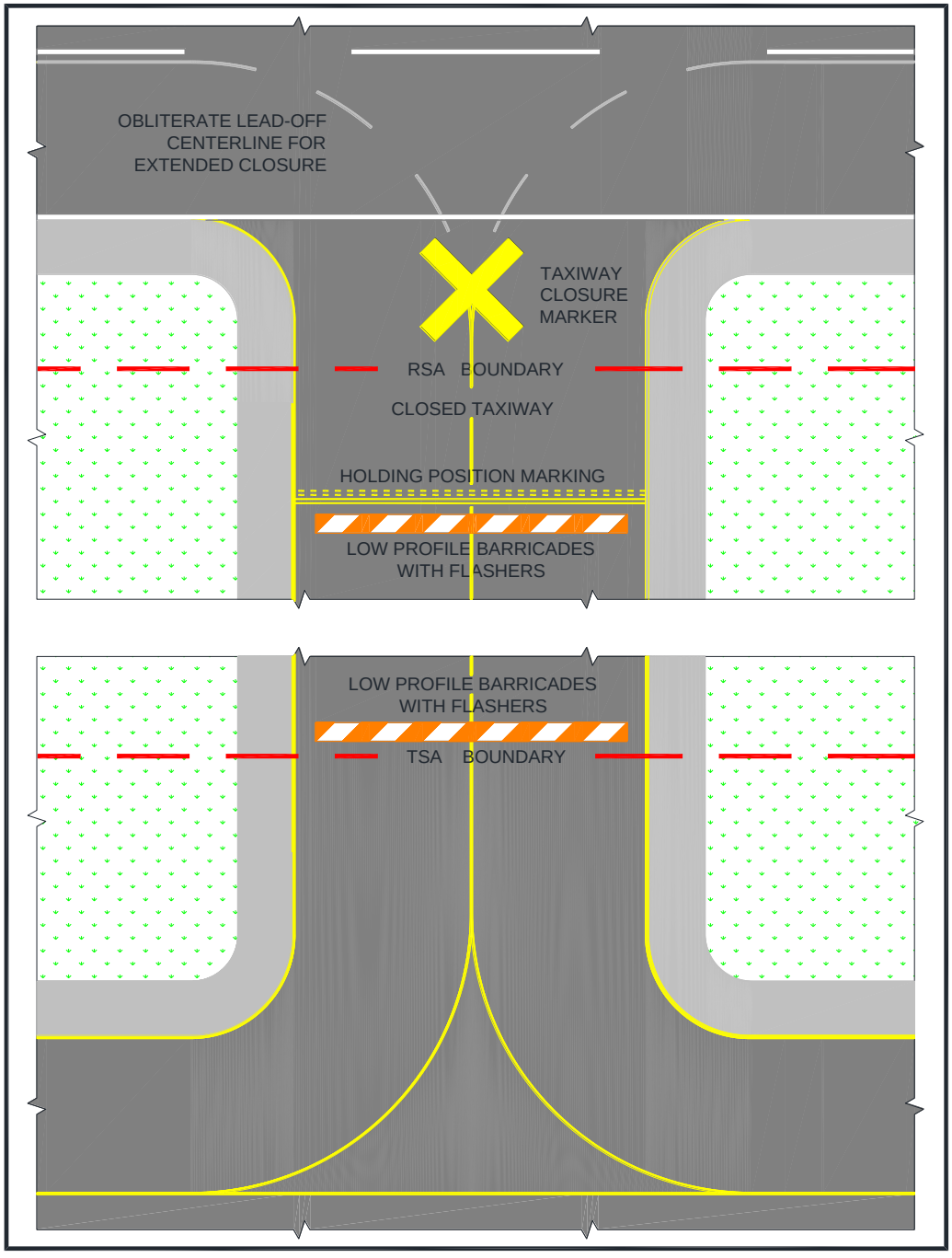
1. **Partially Closed Runways.** Pavement markings for temporary closed portions of the runway consist of a runway threshold bar, runway designation, and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see AC 150/5340-1). Obliterate or cover markings prior to the moved threshold. Existing touchdown zone markings beyond the moved threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-4.

2. **Displaced Thresholds.** Pavement markings for a displaced threshold consist of a runway threshold bar, runway designation, and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See AC 150/5340-1. Obliterate markings prior to the displaced threshold. Existing touchdown zone markings beyond the displaced threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-2.

2.18.2.1.4 Taxiways.

1. **Permanently Closed Taxiways.** AC 150/5300-13 *Airport Design*, notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. See Figure 2-4.

Figure 2-4. Temporary Taxiway Closure



2. **Temporarily Closed Taxiways.** Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines and taxiway to taxiway turns, leading to the closed section. Always obliterate runway lead-off lines for high speed exits, regardless of the duration of the closure. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed. See Figure 2-4.

2.18.2.1.5 Temporarily Closed Airport.

When the airport is closed temporarily, mark all the runways as closed.

2.18.2.2 If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents. Items used to secure such markings must be of a color similar to the marking.

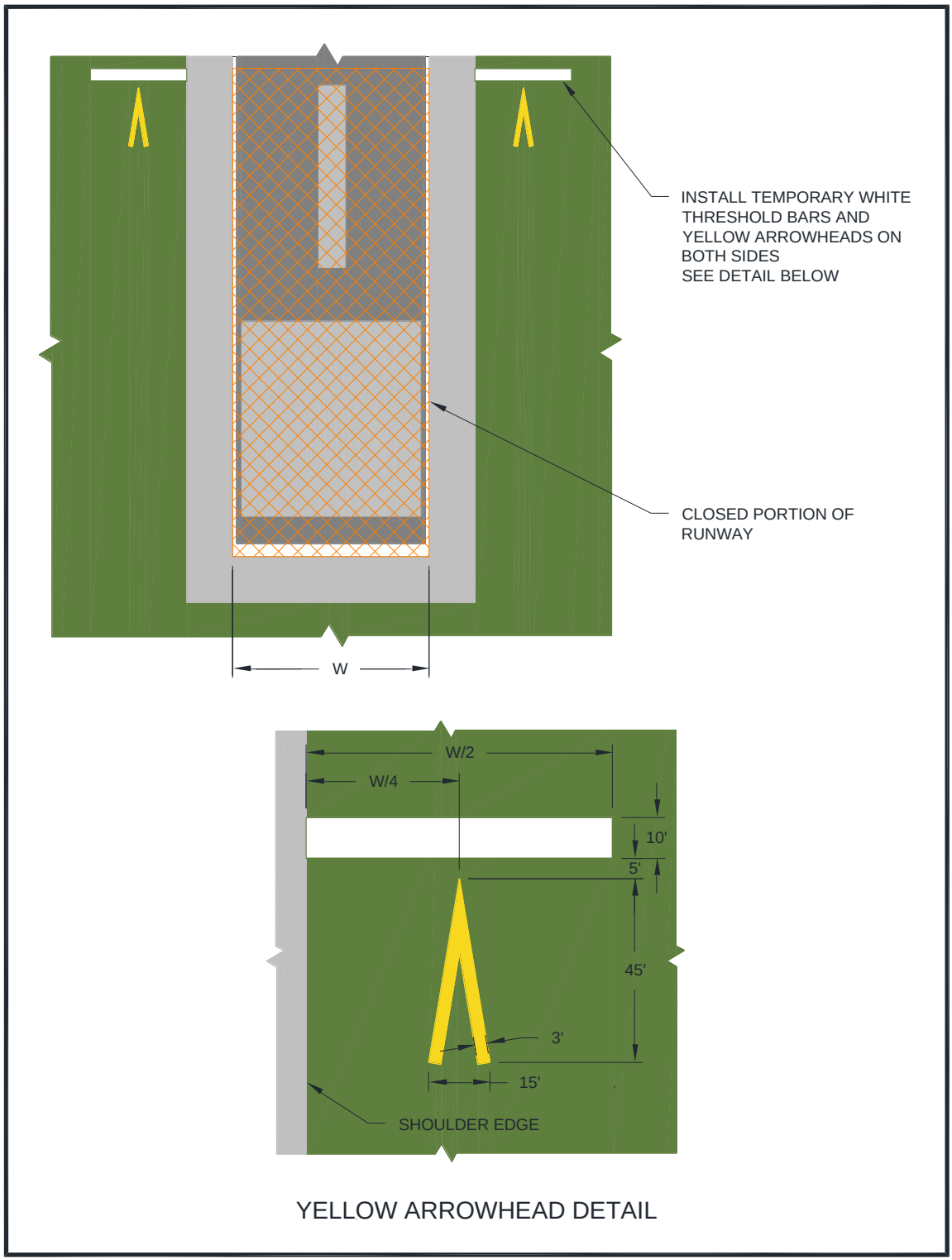
2.18.2.3 It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

2.18.2.4 If it is not possible to install threshold bars, chevrons, and arrows on the pavement, "temporary outboard white threshold bars and yellow arrowheads", see Figure 2-5, may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimensions must be as shown in Figure 2-5. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

2.18.2.5 The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in AC 150/5370-10), but the dimensions must meet the existing standards. When applying temporary markings at night, it is recommended that the fast curing, Type II paint be used to help offset the higher humidity and cooler temperatures often experienced at night. Diluting the paint will substantially increase cure time and is not recommended. Glass beads are not recommended for temporary markings. Striated markings may also be used for certain temporary markings. AC

150/5340-1, *Standards for Airport Markings*, has additional guidance on temporary markings.

Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads



2.18.3 Lighting and Visual NAVAIDs.

This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting installation must be in conformance with AC 150/5340-30, *Design and Installation Details for Airport Visual Aids,* and fixture design in conformance with AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights.* When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. See AC 150/5340-26, *Maintenance of Airport Visual Aid Facilities*, for disconnect procedures and safety precautions. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Maintain mandatory hold signs to operate normally in any situation where pilots or vehicle drivers could mistakenly be in that location. At towered airports certificated under Part 139, holding position signs are required to be illuminated on open taxiways crossing to closed or inactive runways. If the holding position sign is installed on the runway circuit for the closed runway, install a jumper to the taxiway circuit to provide power to the holding position sign for nighttime operations. Where it is not possible to maintain power to signs that would normally be operational, install barricades to exclude aircraft. Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 illustrate temporary changes to lighting and visual NAVAIDs.

2.18.3.1 **Permanently Closed Runways and Taxiways.**

For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

2.18.3.2 **Temporarily Closed Runways and New Runways Not Yet Open to Air Traffic.**

If available, use a lighted X, both at night and during the day, placed at each end of the runway on or near the runway designation numbers facing the approach. (Note that the lighted X must be illuminated at all times that it is on a runway.) The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure.* For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-6 shows a lighted X by day. Figure 2-7 shows a lighted X at night.

Figure 2-6. Lighted X in Daytime

Figure 2-7. Lighted X at Night

2.18.3.3 **Partially Closed Runways and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially

closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service.

2.18.3.3.1 Partially Closed Runways.

Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixtures in such a way as to prevent light leakage. See Figure 2-1.

2.18.3.3.2 Temporary Displaced Thresholds.

Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light (white for visual runways) in the opposite direction. If the displacement is 700 feet or less, blank out centerline lights in the direction of approach or place the centerline lights out of service. If the displacement is over 700 feet, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds. See Figure 2-2.

2.18.3.3.3 Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

2.18.3.3.4 A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 2.18.2.1.3. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, *Specification for L-853, Runway and Taxiway Retroreflective Markers.*

2.18.3.3.5 Temporary threshold lights and runway end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 inch (7.6 cm) above ground. (The standard above ground height for airport lighting fixtures is 14 inches (35 cm)). When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

2.18.3.3.6 Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may

be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

2.18.3.3.7 When runway thresholds are temporarily displaced, reconfigure yellow lenses (caution zone), as necessary, and place the centerline lights out of service.

2.18.3.3.8 Relocate the Visual Glide Slope Indicator (VGSI), such as Visual Approach Slope Indicator (VASI) and Precision Approach Path Indicator (PAPI); other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense. See FAA JO 6850.2, *Visual Guidance Lighting Systems,* for installation criteria for FAA owned and operated NAVAIDs.

2.18.3.3.9 Issue a NOTAM to inform pilots of temporary lighting conditions.

2.18.3.4 **Temporarily Closed Taxiways.**

If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open), cover the light fixture in a way as to prevent light leakage.

2.18.4 Signs.

To the extent possible, signs must be in conformance with AC 150/5345-44, *Specification for Runway and Taxiway Signs*, and AC 150/5340-18, *Standard for Airport Sign Systems.*

2.18.4.1 **Existing Signs.**

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function or would provide conflicting information, it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

2.18.4.2 **Temporary Signs.**

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot "information overload," the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. Temporary signs must meet the standards for such signs in Engineering Brief 93, *Guidance for the Assembly and Installation of Temporary Orange Construction Signs.* Many criteria in AC 150/5345-44, *Specification for Runway and Taxiway Signs*, are referenced in the Engineering Brief. Permissible sign legends are:

1. CONSTRUCTION AHEAD,
2. CONSTRUCTION ON RAMP, and
3. RWY XX TAKEOFF RUN AVAILABLE XXX FT.

Phasing, supported by drawings and sign schedule, for the installation of orange construction signs must be included in the CSPP or SPCD.

2.18.4.2.1 Takeoff Run Available (TORA) signs.

Recommended: Where a runway has been shortened for takeoff, install orange TORA signs well before the hold lines, such as on a parallel taxiway prior to a turn to a runway hold position. See EB 93 for sign size and location.

2.18.4.2.2 Sign legends are shown in Figure F-1.

Note: See Figure E-1, Figure E-2, Figure E-3, Figure F-2, and Figure F-3 for examples of orange construction sign locations.

2.19 **Marking and Signs for Access Routes.**

The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, *Frangible Connections*, which may require modification to size and height guidance in the MUTCD.

2.20 **Hazard Marking, Lighting and Signing.**

2.20.1 Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft, and prevent construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

2.20.2 Equipment.

2.20.2.1 **Barricades.**

Low profile barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude aircraft, gaps between barricades must be smaller than the wingspan of the smallest aircraft to be excluded; if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 feet (1.2 meters). Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

2.20.2.2 **Lights.**

Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 feet (3 meters). Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

2.20.2.3 **Supplement Barricades with Signs (for example) As Necessary.**

Examples are “No Entry” and “No Vehicles.” Be aware of the increased effects of wind and jet blast on barricades with attached signs.

2.20.2.4 **Air Operations Area – General.**

Barricades are not permitted in any active safety area or on the runway side of a runway hold line. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, highly reflective collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 inch (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, and other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inch (7.6 cm) above the ground. Figure 2-8 and Figure 2-9 show sample barricades with proper coloring and flags.

Figure 2-8. Interlocking Barricades

Figure 2-9. Low Profile Barricades

2.20.2.5 **Air Operations Area – Runway/Taxiway Intersections.**

Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

2.20.2.6 **Air Operations Area – Other.**

Beyond runway and taxiway object free areas and aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

2.20.2.7 **Maintenance.**

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

2.21 Work Zone Lighting for Nighttime Construction.

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to AC 150/5370-10 for minimum illumination levels for nighttime paving projects. Additionally, it is recommended that all support equipment, except haul trucks, be equipped with artificial illumination to safely

illuminate the area immediately surrounding their work areas. The lights should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers should be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Shielding may be necessary. Light towers should be removed from the construction site when the area is reopened to aircraft operations. Construction lighting units should be identified and generally located on the construction phasing plans in relationship to the ATCT and active runways and taxiways.

2.22 **Protection of Runway and Taxiway Safety Areas.**

Runway and taxiway safety areas, OFZs, OFAs, and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (see paragraph 2.13.5) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

2.22.1 Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

2.22.1.1 No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (See AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published, and appropriate NOTAMs issued. See AC 150/5300-13 for guidance on the use of declared distances.

2.22.1.2 The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

2.22.1.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

2.22.1.4 **Excavations.**

2.22.1.4.1 Open trenches or excavations are not permitted within the RSA while the runway is open. Backfill trenches before the runway is opened. If backfilling excavations before the runway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

2.22.1.4.2 Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.1.5 **Erosion Control.**

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.2 Runway Object Free Area (ROFA).

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

2.22.3 Taxiway Safety Area (TSA).

2.22.3.1 A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Since the width of the TSA is equal to the wingspan of the design aircraft, no construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction. Give special consideration to TSA dimensions at taxiway turns and intersections. (see AC 150/5300-13).

2.22.3.2 The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

2.22.3.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

2.22.3.4 **Excavations.**

1. Curves. Open trenches or excavations are not permitted within the TSA while the taxiway is open. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
2. Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for unrestricted aircraft operations. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations to allow the safe passage of ARFF equipment and of the heaviest aircraft operating on the taxiway across the trench without causing damage to the equipment or aircraft. In rare circumstances where the section of taxiway is indispensable for aircraft movement, open trenches or excavations may be permitted in the TSA while the taxiway is open to aircraft operations, subject to the following restrictions:
    a. Taxiing speed is limited to 10 mph.
    b. Appropriate NOTAMs are issued.
    c. Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
    d. Low mass, low-profile lighted barricades are installed.
    e. Appropriate temporary orange construction signs are installed.
3. Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.3.5 **Erosion control.**

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.4 Taxiway Object Free Area (TOFA).

Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus, the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

2.22.4.1 The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available. Give special consideration to TOFA dimensions at taxiway turns and intersections.

2.22.4.2 Offset taxiway centerline and edge pavement markings (do not use glass beads) may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting, centerline reflectors, or taxiway edge reflectors are required. Existing lighting that does not coincide with the temporary markings must be taken out of service.

2.22.4.3 Construction activity, including open excavations, may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:

2.22.4.3.1 Taxiing speed is limited to 10 mph.

2.22.4.3.2 NOTAMs issued advising taxiing pilots of hazard and recommending reduced taxiing speeds on the taxiway.

2.22.4.3.3 Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.

2.22.4.3.4 If desired, appropriate orange construction signs are installed. See paragraph 2.18.4.2 and Appendix F.

2.22.4.3.5 Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the usable pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.

2.22.4.3.6 Flaggers furnished by the contractor must be used to direct and control construction equipment and personnel to a pre-established setback distance for safe passage of aircraft, and airline and/or airport personnel. Flaggers must also be used to direct taxiing aircraft. Due to liability issues, the airport operator should require airlines to provide flaggers for directing taxiing aircraft.

2.22.5 Obstacle Free Zone (OFZ).

In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6 Runway Approach/Departure Areas and Clearways.

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6.1 Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

2.22.6.2 **Caution About Partial Runway Closures.**

When filing a NOTAM for a partial runway closure, clearly state that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

2.22.6.3 **Caution About Displaced Thresholds.**

Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, or other work within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

2.23 **Other Limitations on Construction.**

The CSPP must specify any other limitations on construction, including but not limited to:

2.23.1 Prohibitions.

2.23.1.1 No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.

2.23.1.2 No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.

2.23.1.3 No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property. See AC 150/5370-10.

2.23.2 Restrictions.

2.23.2.1 Construction suspension required during specific airport operations.

2.23.2.2 Areas that cannot be worked on simultaneously.

2.23.2.3 Day or night construction restrictions.

2.23.2.4 Seasonal construction restrictions.

2.23.2.5 Temporary signs not approved by the airport operator.

2.23.2.6 Grades changes that could result in unplanned effects on NAVAIDs.

CHAPTER 3. GUIDELINES FOR WRITING A CSPP

3.1 General Requirements.

The CSPP is a standalone document written to correspond with the subjects outlined in paragraph 2.4. The CSPP is organized by numbered sections corresponding to each subject listed in paragraph 2.4, and described in detail in paragraphs 2.5 - 2.23. Each section number and title in the CSPP matches the corresponding subject outlined in paragraph 2.4 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

3.2 Applicability of Subjects.

Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA ILS cables during trenching operations could be considered FAA ATO coordination (Coordination, paragraph 2.5.3), an area and operation affected by the construction activity (Areas and Operations Affected by the Construction Activity, paragraph 2.7.1.4), a protection of a NAVAID (Protection of Navigational Aids (NAVAIDs), paragraph 2.8), or a notification to the FAA of construction activities (Notification of Construction Activities, paragraph 2.13.5.3.2). However, it is more specifically an underground utility requirement (Underground Utilities, paragraph 2.15). The procedure for protecting underground ILS cables during trenching operations should therefore be described in 2.4.2.11: "The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings." All other applicable sections should include a reference to 2.4.2.11: "ILS cables shall be identified and protected as described in 2.4.2.11" or "See 2.4.2.11 for ILS cable identification and protection requirements." Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

3.3 Graphical Representations.

Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

3.4 **Reference Documents.**

The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor. Where this AC recommends references (e.g. as in paragraph 3.9) the intent is to include a reference to the corresponding section in the CSPP, not to this Advisory Circular.

3.5 **Restrictions.**

The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent ("as-built") features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

3.6 **Coordination.**

Include in this section a detailed description of conferences and meetings to be held both before and during the project. Include appropriate information from AC 150/5370-12. Discuss coordination procedures and schedules for each required FAA ATO Technical Operations shutdown and restart and all required flight inspections.

3.7 **Phasing.**

Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 3.8, as appropriate.

3.8 **Areas and Operations Affected by Construction.**

Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. See Appendix F for sample operational effects tables and figures.

3.9 **NAVAID Protection.**

List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 3.6 for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 3.14 for the

issuance of NOTAMs as required. Include a reference to paragraph 3.16 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 3.19. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

3.10 **Contractor Access.**

This will necessarily be the most extensive section of the CSPP. Provide sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

3.10.1 Location of Stockpiled Construction Materials.

Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 3.11 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 3.12 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

3.10.2 Vehicle and Pedestrian Operations.

While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying HAZMAT vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

3.10.3 Two-Way Radio Communications.

Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor CTAF at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light

signals, telephone numbers, others) must be included. All radio frequencies should by identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

3.10.4 Airport Security.

Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

3.11 **Wildlife Management.**

Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 3.10 for security (wildlife) fence integrity maintenance as required.

3.12 **FOD Management.**

In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 3.15 for inspection requirements as required.

3.13 **HAZMAT Management.**

Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be identified. Include a reference to paragraph 3.10 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

3.14 **Notification of Construction Activities.**

List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to

Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. Identify the E911 address of the airport and the emergency access route via haul roads to the construction site. Require the contractor to have this information available to all workers. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 3.10. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

3.15 **Inspection Requirements.**

Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) or other airport operator's representative and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

3.16 **Underground Utilities.**

Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 3.14 for notification of utility owners of accidental utility disruption as required.

3.17 **Penalties.**

Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, VPD, and others.

3.18 **Special Conditions.**

Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 3.10 for compliance with airport safety and security measures and for radio communications as required. Include

a reference to paragraph 3.14 for emergency notification of all involved parties, including police/security, ARFF, and medical services.

3.19 **Runway and Taxiway Visual Aids.**

Include marking, lighting, signs, and visual NAVAIDS. Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDs required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDs that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDs such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, *Standards for Airport Markings;* AC 150/5340-18, *Standards for Airport Sign Systems;* and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDs.

3.20 **Marking and Signs for Access Routes.**

Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration MUTCD and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

3.21 **Hazard Marking and Lighting.**

Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 3.14. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

3.22 **Work Zone Lighting for Nighttime Construction.**

If work is to be conducted at night, specify all lighting equipment, including when and where each type of device is to be used. Indicate the direction lights are to be aimed and any directions that aiming of lights is prohibited. Specify any shielding necessary in instances where aiming is not sufficient to prevent interference with air traffic control and aircraft operations. Attach drawings to graphically indicate the placement and aiming of lighting equipment. Where the plan only indicates directions that aiming of lights is prohibited, the placement and positioning of portable lights must be proposed by the Contractor and approved by the airport operator’s representative each time lights are relocated or repositioned.

3.23 **Protection of Runway and Taxiway Safety Areas.**

This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13, as required. Include a reference to paragraph 3.10 for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 3.10 for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide the required Runway Safety Area, include a reference to paragraphs 3.14 and 3.19. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13, as required. Include a reference to paragraph 3.24 for height (i.e., crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional "box" within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

3.24 **Other Limitations on Construction.**

This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e., crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 3.7 for project phasing requirements based on construction limitations as required.

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APPENDIX A. RELATED READING MATERIAL

Obtain the latest version of the following free publications from the FAA on its Web site at http://www.faa.gov/airports/.

Table A-1. FAA Publications

Number	Title and Description
AC 150/5200-28	*Notices to Airmen (NOTAMs) for Airport Operators* Guidance for using the NOTAM System in airport reporting.
AC 150/5200-30	*Airport Field Condition Assessments and Winter Operations Safety* Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
AC 150/5200-33	*Hazardous Wildlife Attractants On or Near Airports* Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports.
AC 150/5210-5	*Painting, Marking, and Lighting of Vehicles Used on an Airport* Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
AC 150/5210-20	*Ground Vehicle Operations to include Taxiing or Towing an Aircraft on Airports* Guidance to airport operators on developing ground vehicle operation training programs.
AC 150/5300-13	*Airport Design* FAA standards and recommendations for airport design. Establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria.
AC 150/5210-24	*Airport Foreign Object Debris (FOD) Management* Guidance for developing and managing an airport foreign object debris (FOD) program

Number	Title and Description
AC 150/5320-15	*Management of Airport Industrial Waste* Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities.
AC 150/5340-1	*Standards for Airport Markings* FAA standards for the siting and installation of signs on airport runways and taxiways.
AC 150/5340-18	*Standards for Airport Sign Systems* FAA standards for the siting and installation of signs on airport runways and taxiways.
AC 150/5345-28	*Precision Approach Path Indicator (PAPI) Systems* FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.
AC 150/5340-30	*Design and Installation Details for Airport Visual Aids* Guidance and recommendations on the installation of airport visual aids.
AC 150/5345-39	*Specification for L-853, Runway and Taxiway Retroreflective Markers*
AC 150/5345-44	*Specification for Runway and Taxiway Signs* FAA specifications for unlighted and lighted signs for taxiways and runways.
AC 150/5345-53	*Airport Lighting Equipment Certification Program* Details on the Airport Lighting Equipment Certification Program (ALECP).
AC 150/5345-50	*Specification for Portable Runway and Taxiway Lights* FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative.
AC 150/5345-55	*Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure*

Number	Title and Description
AC 150/5370-10	*Standards for Specifying Construction of Airports* Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
AC 150/5370-12	*Quality Management for Federally Funded Airport Construction Projects*
EB 93	*Guidance for the Assembly and Installation of Temporary Orange Construction Signs*
FAA Order 5200.11	FAA Airports (ARP) Safety Management System (SMS) Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS.
FAA Certalert 98-05	*Grasses Attractive to Hazardous Wildlife* Guidance on grass management and seed selection.
FAA Form 7460-1	Notice of Proposed Construction or Alteration
FAA Form 7480-1	Notice of Landing Area Proposal
FAA Form 6000.26	National NAS Strategic Interruption Service Level Agreement, Strategic Events Coordination, Airport Sponsor Form

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at http://www.ecfr.gov/.

Table A-2. Code of Federal Regulation

Number	Title
Title 14 CFR Part 77	Safe, Efficient Use and Preservation of the Navigable Airspace
Title 14 CFR Part 139	Certification of Airports
Title 49 CFR Part 1542	Airport Security

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at http://mutcd.fhwa.dot.gov/.

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APPENDIX B. TERMS AND ACRONYMS

Table B-1. Terms and Acronyms

Term	Definition
Form 7460-1	Notice of Proposed Construction or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. (See guidance available on the FAA web site at https://oeaaa.faa.gov.) The form may be downloaded at http://www.faa.gov/airports/resources/forms/, or filed electronically at: https://oeaaa.faa.gov.
Form 7480-1	Notice of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport The form may be downloaded at http://www.faa.gov/airports/resources/forms/.
Form 6000-26	Airport Sponsor Strategic Event Submission Form
AC	Advisory Circular
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area, as defined in 14 CFR Part 107. Means a portion of an airport, specified in the airport security program, in which security measures are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. This area does not include the secured area of the airport terminal building.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
AT	Air Traffic
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under

Term	Definition
	the authority of 14 CFR Part 139, *Certification of Airports*.
CFR	Code of Federal Regulations
Construction	The presence of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety and Phasing Plan. 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.
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FOD	Foreign Object Debris/Damage
FSS	Flight Service Station
GA	General Aviation
HAZMAT	Hazardous Materials
HMA	Hot Mix Asphalt
IAP	Instrument Approach Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
Movement Area	The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.

Term	Definition
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OCC	Operations Control Center
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See AC 150/5300-13 for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to AC 150/5300-13 for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
OTS	Out of Service
P&R	Planning and Requirements Group
NPI	NAS Planning & Integration
PAPI	Precision Approach Path Indicator
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicator
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RA	Reimbursable Agreement
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.
SDS	Safety Data Sheet
SIDA	Security Identification Display Area
SMS	Safety Management System

Term	Definition
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
SSC	System Support Center
Taxiway Safety Area	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13.
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See AC 150/5300-13 for guidance on declared distances.
TSA	Taxiway Safety Area, or Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicator
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI), visual approach slope indicator (VASI), and pulse light approach slope indicator (PLASI).
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not a required submittal.

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	2.5				
Operational safety is a standing agenda item for construction progress meetings.	2.5				
Scheduling of the construction phases is properly addressed.	2.6				
Any formal agreements are established.	2.5.3				
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	2.7.1				
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	2.7.1.1				
Access routes used by ARFF vehicles affected by the project are addressed.	2.7.1.2				
Access routes used by airport and airline support vehicles affected by the project are addressed.	2.7.1.3				
Underground utilities, including water supplies for firefighting and drainage.	2.7.1.4				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	2.7.1.5				
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	2.7.1				
Temporary changes to taxi operations are addressed.	2.7.2.1				
Detours for ARFF and other airport vehicles are identified.	2.7.2.2				
Maintenance of essential utilities and underground infrastructure is addressed.	2.7.2.3				
Temporary changes to air traffic control procedures are addressed.	2.7.2.4				
NAVAIDs					
Critical areas for NAVAIDs are depicted on drawings.	2.8				
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	2.8				
Protection of NAVAID facilities is addressed.	2.8				
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	2.8				
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	2.8, 2.13.1, 2.13.5.3.1, 2.18.1				
Contractor Access					
The CSPP addresses areas to which contractor will have access and how	2.9				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
the areas will be accessed.					
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	2.9				
The location of stockpiled construction materials is depicted on drawings.	2.9.1				
The requirement for stockpiles in the ROFA to be approved by FAA is included.	2.9.1				
Requirements for proper stockpiling of materials are included.	2.9.1				
Construction site parking is addressed.	2.9.2.1				
Construction equipment parking is addressed.	2.9.2.2				
Access and haul roads are addressed.	2.9.2.3				
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, *Painting, Marking and Lighting of Vehicles Used on an Airport,* is included.	2.9.2.4				
Proper vehicle operations, including requirements for escorts, are described.	2.9.2.5, 2.9.2.6				
Training requirements for vehicle drivers are addressed.	2.9.2.7				
Two-way radio communications procedures are described.	2.9.2.9				
Maintenance of the secured area of the airport is addressed.	2.9.2.10				
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	2.10				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign Object Debris Management					
The airport operator's FOD management procedures are addressed.	2.11				
Hazardous Materials Management					
The airport operator's hazardous materials management procedures are addressed.	2.12				
Notification of Construction Activities					
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	2.13				
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	2.13.1				
A list of local ATO/Technical Operations personnel is included.	2.13.1				
A list of ATCT managers on duty is included.	2.13.1				
A list of authorized representatives to the OCC is included.	2.13.2				
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	2.8, 2.13.2, 2.18.3.3.9				
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	2.13.2				
Emergency notification procedures for medical, fire fighting, and police	2.13.3				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	2.13.4				
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	2.13.5				
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	2.13.5.3.2				
Inspection Requirements					
Daily and interim inspections by both the airport operator and contractor are specified.	2.14.1, 2.14.2				
Final inspections at certificated airports are specified when required.	2.14.3				
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	2.15				
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	2.16				
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	2.17				
Runway and Taxiway Visual Aids - Marking, Lighting, Signs, and Visual NAVAIDs					
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	2.18.1				
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	2.18.1, 2.18.3, 2.18.4.2, 2.20.2.4				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
The requirement for markings to be in compliance with AC 150/5340-1, *Standards for Airport Markings*, is specified.	2.18.2				
Detailed specifications for materials and methods for temporary markings are provided.	2.18.2				
The requirement for lighting to conform to AC 150/5340-30, *Design and Installation Details for Airport Visual Aids;* AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights;* and AC 150/5345-53, *Airport Lighting Certification Program*, is specified.	2.18.3				
The use of a lighted X is specified where appropriate.	2.18.2.1.2, 2.18.3.2				
The requirement for signs to conform to AC 150/5345-44, *Specification for Runway and Taxiway Signs;* AC 50/5340-18, *Standards for Airport Sign Systems;* and AC 150/5345-53, *Airport Lighting Certification Program*, is specified.	2.18.4				
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications.	2.18.4.2				
Hazard Marking and Lighting					
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	2.20.1				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	2.20.1				
The CSPP considers less obvious construction-related hazards.	2.20.1				
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	2.20.2.1				
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	2.20.2.1				
Red lights meeting the luminance requirements of the State Highway Department are specified.	2.20.2.2				
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 inch high.	2.20.2.3				
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	2.20.2.3				
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	2.20.2.5				
Markings for temporary closures are specified.	2.20.2.5				
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	2.20.2.7				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Work Zone Lighting for Nighttime Construction					
If work is to be conducted at night, the CSPP identifies construction lighting units and their general locations and aiming in relationship to the ATCT and active runways and taxiways.	2.21				
Protection of Runway and Taxiway Safety Areas					
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	2.22.1.1, 2.22.3.1				
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	2.22.1.2, 2.22.3.2				
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	2.22.3.3				
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open, subject to approved exceptions.	2.22.1.4				
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	2.22.1.4				
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	2.22.1.4				
Grading and soil erosion control to maintain RSA/TSA standards are	2.22.3.5				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	2.22.2				
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	2.22.3				
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	2.22.4				
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	2.22.4.3.6				
Provisions for protection of runway approach/departure areas and clearways are included.	2.22.6				
Other Limitations on Construction					
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	2.23.1.2				
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	2.23.1.3				

APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

Table D-1. Potentially Hazardous Conditions

Item	Action Required (Describe)	No Action Required (Check)
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.		
Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends.		
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.		
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.		
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and		

Item	Action Required (Describe)	No Action Required (Check)
approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.		
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Obliterated or faded temporary markings on active operational areas.		
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		

Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Lack of radio communications with construction vehicles in airport movement areas.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

Item	Action Required (Describe)	No Action Required (Check)
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Site burning, which can cause possible obscuration.		
Construction work taking place outside of designated work areas and out of phase.		

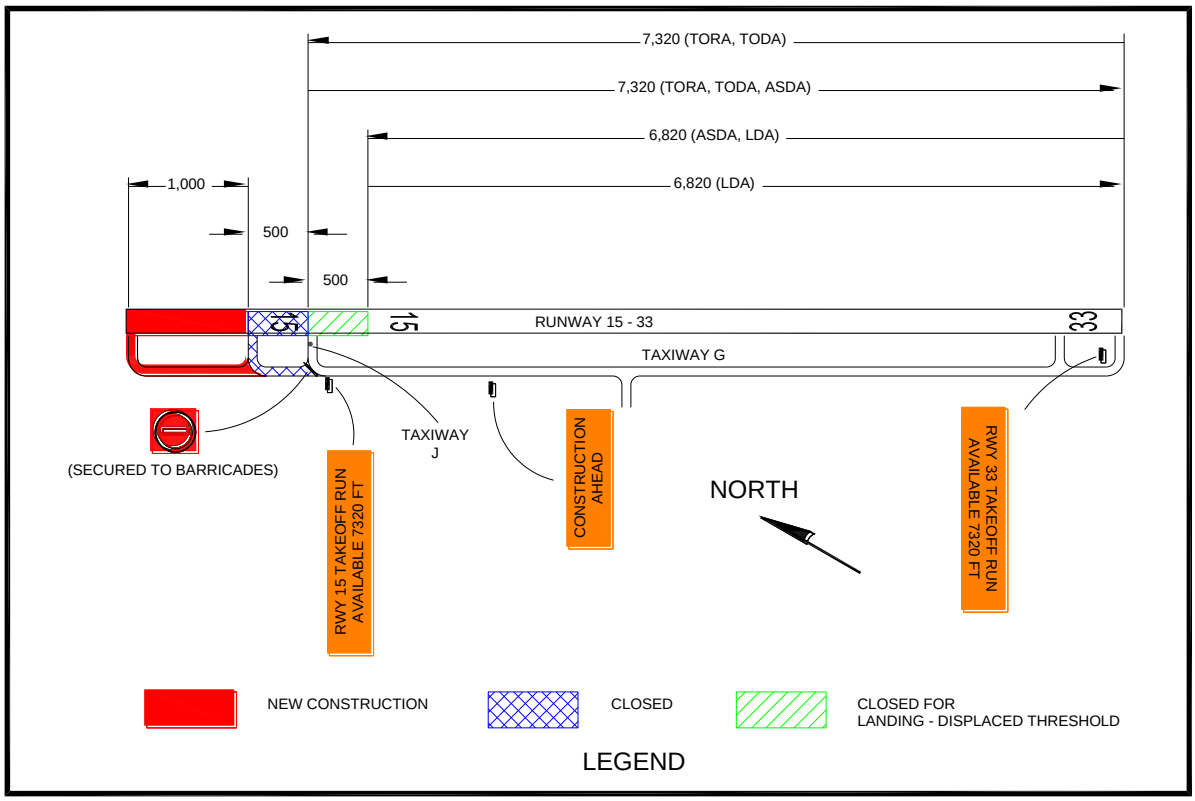
APPENDIX E. SAMPLE OPERATIONAL EFFECTS TABLE

E.1 Project Description.

Runway 15-33 is currently 7820 feet long, with a 500 foot stopway on the north end. This project will remove the stopway and extend the runway 1000 feet to the north and 500 feet to the south. Finally, the existing portion of the runway will be repaved. The runway 33 glide slope will be relocated. The new runway 33 localizer has already been installed by FAA Technical Operations and only needs to be switched on. Runway 15 is currently served only by a localizer, which will remain in operation as it will be beyond the future RSA. Appropriate NOTAMS will be issued throughout the project.

E.1.1 During Phase I, the runway 15 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 15 takeoff and the departure end of runway 33 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 33 will be adjusted to provide the required RSA and applicable departure surface. Excavation near Taxiway G will require its ADG to be reduced from IV to III. See Figure E-1.

Figure E-1. Phase I Example

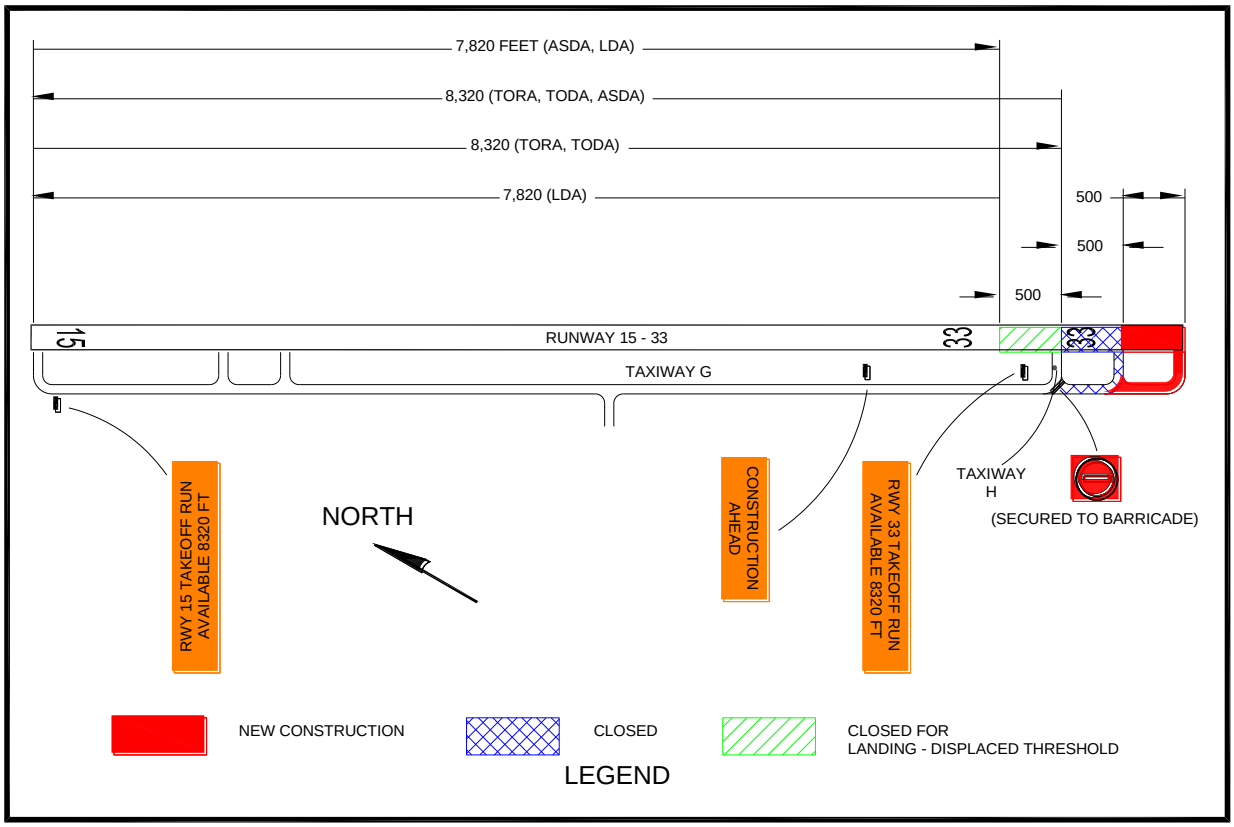


Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 33 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.2 During Phase II, the runway 33 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 33 takeoff and the departure end of runway 15 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 15 will be adjusted to provide the required RSA and applicable departure surface. See Figure E-2.

Figure E-2. Phase II Example



Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 15 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.3 During Phase III, the existing portion of the runway will be repaved with Hot Mix Asphalt (HMA) and the runway 33 glide slope will be relocated. Construction will be accomplished between the hours of 8:00 pm and 5:00 am, during which the runway will be closed to operations.

Figure E-3. Phase III Example

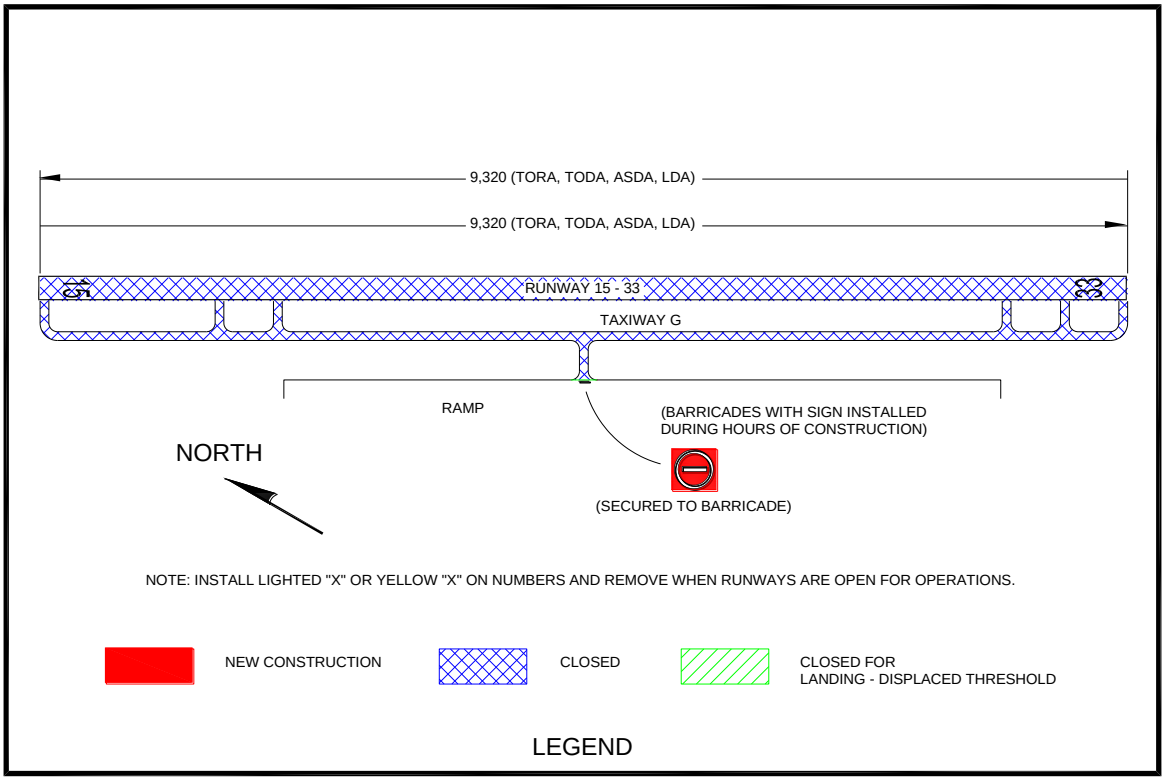


Table E-1. Operational Effects Table

Project	**Runway 15-33 Extension and Repaving**			
Phase	**Normal (Existing)**	**Phase I: Extend Runway 15 End**	**Phase II: Extend Runway 33 End**	**Phase III: Repave Runway**
Scope of Work	N/A	Extend Runway 15-33 1,000 ft on north end with Hot Mix Asphaltic Concrete (HMA).	Extend Runway 15-33 500 ft on south end with Hot Mix Asphaltic Concrete (HMA).	Repave existing runway with HMA Relocate Runway 33 Glide Slope
Effects of Construction Operations	N/A	Existing North 500 ft closed	Existing South 500 ft closed	Runway closed between 8:00 pm and 5:00 am Edge lighting out of service
Construction Phase	N/A	Phase I (Anticipated)	Phase II (Anticipated)	Phase III (Anticipated)
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 40 /day GA: 26 /day Military: 0 /day	Carrier: 45 /day GA: 26 /day Military: 5 /day	Carrier: 45 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 30 /day GA: 18 /day Military: 0 /day	Carrier: 25 /day GA: 18 /day Military: 5 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 Aircraft Category	C-IV	C-IV	C-IV	C-IV
Runway 15 Approach Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Runway 33 Approach Visibility Minimums	¾ mile	¾ mile	¾ mile	1 mile

Note: Proper coordination with Flight Procedures group is necessary to maintain instrument approach procedures during construction.

Project		Runway 15-33 Extension and Repaving			
Phase		Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Runway 15 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	7,820	7,320	7,820	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 33 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	8,320	6,820	8,320	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 15 Approach Procedures		LOC only	LOC only	LOC only	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 33 Approach Procedures		ILS	ILS	ILS	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 15 NAVAIDs		LOC	LOC	LOC	LOC
Runway 33 NAVAIDs		ILS, MALSR	ILS, MALSR	ILS, MALSR	LOC, MALSR
Taxiway G ADG		IV	III	IV	IV
Taxiway G TDG		4	4	4	4
ATCT (hours open)		24 hours	24 hours	24 hours	0500 - 2000
ARFF Index		D	D	D	D

Project	Runway 15-33 Extension and Repaving			
Phase	**Normal (Existing)**	**Phase I: Extend Runway 15 End**	**Phase II: Extend Runway 33 End**	**Phase III: Repave Runway**
Special Conditions	Air National Guard (ANG) military operations	All military aircraft relocated to alternate ANG Base	Some large military aircraft relocated to alternate ANG Base	All military aircraft relocated to alternate ANG Base
Information for NOTAMs		Refer above for applicable declared distances. Taxiway G limited to 118 ft wingspan	Refer above for applicable declared distances.	Refer above for applicable declared distances. Airport closed 2000 – 0500. Runway 15 glide slope OTS.

Note: This table is one example. It may be advantageous to develop a separate table for each project phase and/or to address the operational status of the associated NAVAIDs per construction phase.

Complete the following chart for each phase to determine the area that must be protected along the runway and taxiway edges:

Table E-2. Runway and Taxiway Edge Protection

Runway/Taxiway	Aircraft Approach Category* A, B, C, or D	Airplane Design Group* I, II, III, or IV	Safety Area Width in Feet Divided by 2*

*See AC 150/5300-13 to complete the chart for a specific runway/taxiway.

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Table E-3. Protection Prior to Runway Threshold

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Distance to Threshold Based on Required Approach Slope*	
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1

*See AC 150/5300-13 to complete the chart for a specific runway.

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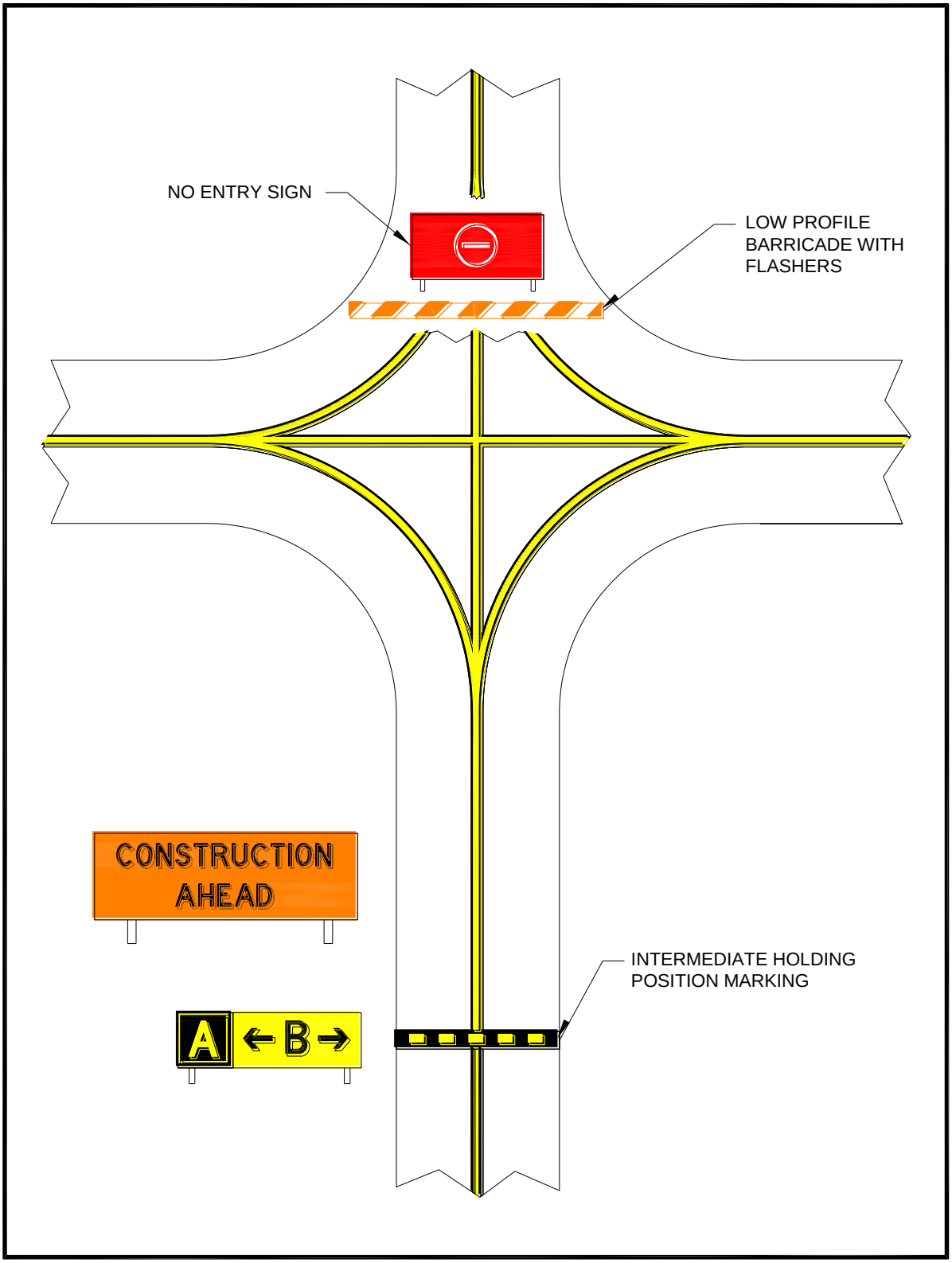
APPENDIX F. ORANGE CONSTRUCTION SIGNS

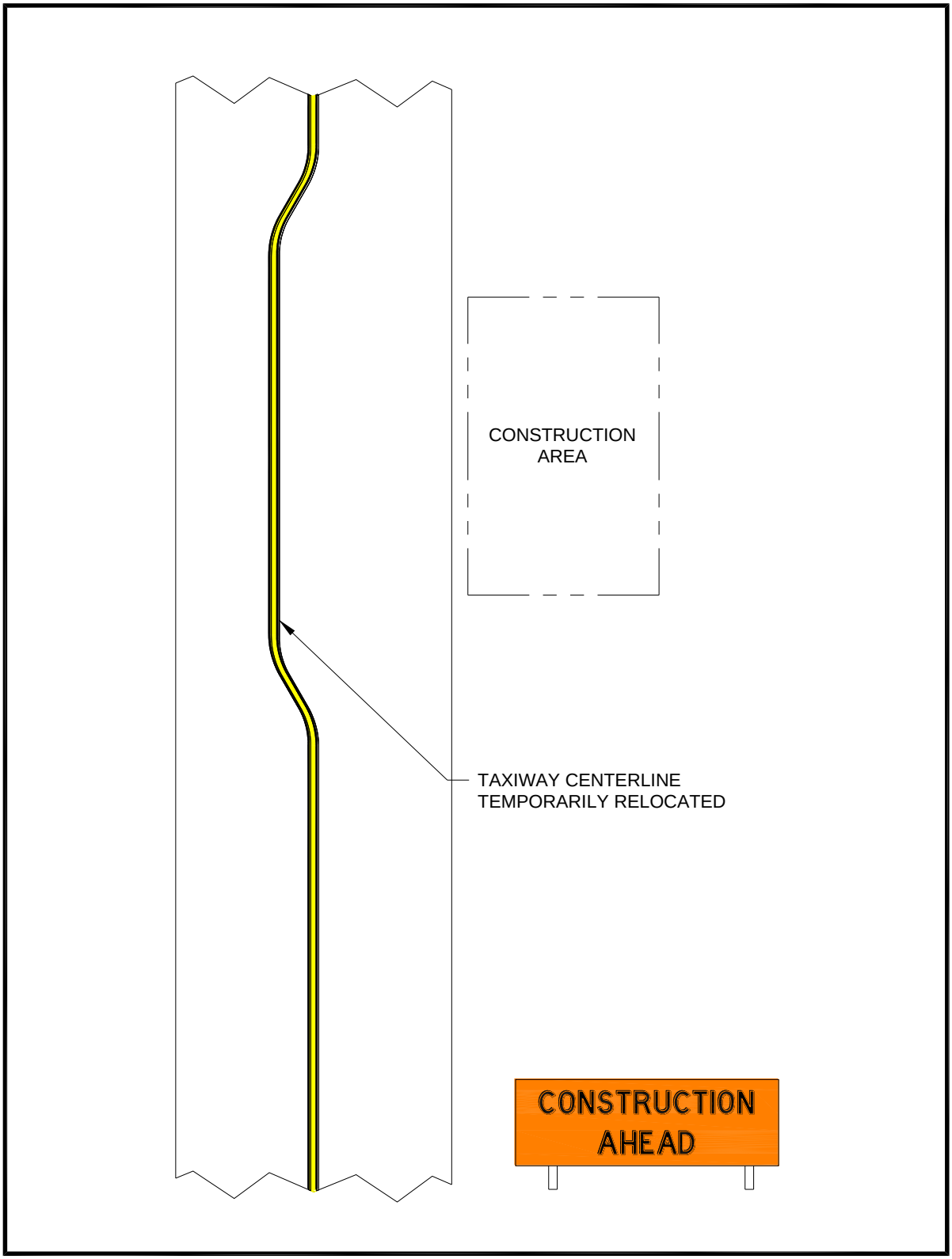
Figure F-1. Approved Sign Legends

Figure F-2. Orange Construction Sign Example 1



Note: For proper placement of signs, refer to EB 93.

Figure F-3. Orange Construction Sign Example 2



Note: For proper placement of signs, refer to EB 93.

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Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Engineering Division, Federal Aviation Administration ATTN: AAS-100, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subject: AC 150/5370-2G Date: _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

_____

Submitted by: _____ Date: _____

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Appendix C
FAA AC 150/5200-28G Notice to Air Missions (NOTAMs) for Airport Operators

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Notice to Air Missions (NOTAMs) for Airport Operators

Date: 5/25/2022 **AC No:** 150/5200-28G
Initiated By: AAS-300

1 **Purpose.**

This Advisory Circular (AC) contains the Federal Aviation Administration (FAA) standards and guidance for airport operators on the issuance of Notice to Air Missions (NOTAM). This AC provides guidance on using the NOTAM system for airport condition reporting and procedures used to describe, format, and disseminate information on unanticipated or temporary changes to components of, or hazards in, the National Airspace System (NAS). The NOTAM system is not intended to be used to advertise data already published or charted.

2 **Cancellation.**

This AC cancels AC 150/5200-28F, *Notices to Airmen (NOTAMs) for Airport Operators,* dated December 30, 2016.

3 **Applicability.**

The FAA standards and guidance in this AC is provided for airport operators, or their agents, who monitor and manage the day-to-day operation of the airport and who may also have operational responsibility for certain airport-related facilities. The audience for this AC is any office responsible for originating airport related NOTAMs. The standards and guidance in this AC are not legally binding in their own right and will not be relied upon by the FAA as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with this AC is voluntary only and nonconformity will not affect rights and obligations under existing statutes and regulations, except as follows:

1. Use of the standards and guidance in this AC is mandatory for airports that receive funding under Federal grant assurance programs, including the Airport Improvement Program (AIP). See Grant Assurance #34.
2. Use of the standards and guidance in this AC is mandatory for projects funded by the Passenger Facility Charge (PFC) program. See PFC Assurance #9.

3. This AC provides an acceptable means of meeting the requirements of 14 Code of Federal Regulations (CFR) Part 139, including § 139.339, *Airport Condition Reporting*.

4 **Principal Changes.**

This AC adds new language on the use of PERM NOTAMs (interim NOTAMs associated with the publishing of permanent airport related information). This language clarifies the responsibilities and the overall process associated with the use of PERM NOTAMs. A list of information that should not be issued via NOTAM is being included to help NOTAM originators determine what information is acceptable as a NOTAM. A summary of changes is included below:

1. AC title changed from Notices to Airmen (NOTAMs) for Airport Operators to Notice to Air Missions (NOTAMs) for Airport Operators.
2. Paragraph 1.4 – PERM NOTAM language information added describing the occurrence when extend period NOTAMs are surpassed.
3. Paragraph 1.6 – Added new information to the airport operator responsibilities.
4. Paragraph 1.6.2 – Added new information on Flight Service Stations (FSS) responsibility to contact users on validity of NOTAMs lingering in the NOTAM system.
5. Paragraph 1.6.3 – Airports District Office (ADO) responsibilities identification changed to Regional Offices (Safety and Standards Branch) throughout the Advisory Circular.
6. Paragraph 1.6.4 – Added new information on United States NOTAMs Office (USNOF) responsibilities.
7. Paragraph 1.8.3 – Additional information added on determining NOTAM issuance criteria.
8. Paragraph 2.3.13 – New language added on the PERM NOTAM process and tools for moving PERM NOTAMs from the NOTAM system to the appropriate chart or publication.
9. Paragraph 2.3.14.4 – Added clarification language and examples on how to apply NOTAM information for spots, gates, or hardstands.
10. Paragraph 3.2.5 – Added new language on preventing surface condition NOTAMS on a closed runway and multiple NOTAMs for surface condition codes on the same runway.
11. Paragraph 3.15.2.5 – Added new language and NOTAM example for Runway End Light (RENL).
12. Paragraph 3.17.3 – Added new language on moving declared distance NOTAMs from the NOTAM system to the appropriate flight publication.
13. Paragraph 3.19 – Added new language and NOTAM examples for bird and wildlife activities.

14. Appendix D – Added new Appendix D to illustrate the available tools and processes for publishing PERM NOTAM information.

5 **Related Code of Federal Regulations (CFRs) and Reference Materials.**

The following are FAA regulations and publications (see current versions) used during the preparation of this AC and may provide useful supporting and/or supplemental information to airport operators, or their agents, in understanding and implementing this AC. Electronic versions of these documents are available online.

1. Electronic CFRs are available at www.ecfr.gov.
   a. 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*
   b. 14 CFR Part 139, *Certification of Airports*
   c. 14 CFR Part 152, *Airport Aid Program*
   d. 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*
   e. 14 CFR Part 161, *Notice and Approval of Airport Noise and Access Restrictions*
   f. 47 CFR Part 17*, Construction, Marking, and Lighting of Antenna Structures*
   g. 49 CFR Part 1542, *Airport Security*
   h. 49 CFR Part 1544, *Aircraft Operator Security: Air Carriers and Commercial Operators*
2. Air Traffic publications are available at www.faa.gov/air_traffic/publications/.
   a. FAA Order JO 7110.10, *Flight Services*
   b. FAA Order JO 7110.65, *Air Traffic Control*
   c. FAA Order JO 7210.3, *Facility Operation and Administration*
   d. FAA Order JO 7340.2, *Contractions*
   e. FAA Order JO 7350.9, *Location Identifiers*
   f. FAA Order 7930.2, *Notices to Air Missions (NOTAMs)*
3. Aeronautical Information Manual (AIM). https://www.faa.gov/air_traffic/publications/atpubs/aim_html/
4. Pilot/Controller Glossary (P/CG). https://www.faa.gov/air_traffic/publications/media/pcg_10-12-17.pdf
5. Airport ACs (150 series) are available at www.faa.gov/airports/resources/advisory_circulars/.
   a. AC 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*
   b. AC 150/5300-13, *Airport Design*
   c. AC 150/5370-2, *Operational Safety on Airports during Construction*

6. Other FAA ACs are available at www.faa.gov/regulations_policies/advisory_circulars/.
   a. AC 70/7460-1, *Obstruction Lighting and Marking*
   b. AC 91-79, *Mitigating the Risks of a Runway Overrun Upon Landing*
   c. AC 120-57, *Surface Movement Guidance and Control System*
   d. AC 121.195-1, *Operational Landing Distances for Wet Runways; Transport Category Airplanes*
7. Other FAA Orders and Notices are available at http://www.faa.gov/regulations_policies/orders_notices/.
   e. FAA Order 8900.1, *Flight Standards Information Management System*
   f. FAA Order 5190.6, *FAA Airport Compliance Manual*
8. The Chart Supplement is available at http://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dafd/.
9. Domestic/International Notices at http://www.faa.gov/air_traffic/publications/notices/.
10. NOTAM Search is available at http://notams.aim.faa.gov/notamSearch/.
11. Airport Improvement Program Grant Assurances are available at: https://www.faa.gov/airports/aip/grant_assurances/media/airport-sponsor-assurances-aip-2020.pdf.
12. Passenger Facility Charge Program Assurances are available at: https://www.faa.gov/airports/pfc/media/pfc-assurance.pdf.

6 **Questions and Comments.**

Use the Advisory Circular Feedback form at this end of this AC to send comments or suggestions for improving this AC. If you have questions about this AC, contact:

Federal Aviation Administration
Office of Airport Safety and Standards, AAS-300
800 Independence Avenue, SW
Washington, DC 20591
Telephone (202) 267-8731

John R. Dermody
Director of Airport Safety and Standards

CONTENTS

Paragraph **Page**

CONTENTS (CONTINUED)

Paragraph **Page**

FIGURES

CONTENTS (CONTINUED)

Paragraph **Page**

TABLES

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Chapter 1. Background and Responsibilities

1.1 Use of this AC.

The Federal Notice to Air Missions (NOTAMs) System (FNS) as discussed in this Advisory Circular (AC) is tailored to airport condition and facility reporting needs. Additionally, it describes the preferred NOTAM system, in this case NOTAM Manager, airport operators should use. See paragraph 1.6.1.7 for information on NOTAM Manager.

1.2 Function of the NOTAM System.

The FNS provides essential information to all airport users concerned with flight and airport operations. Using the FNS satisfies the requirements of 14 CFR § 139.339. The essential information functions associated with NOTAMs are:

1.2.1 Providing timely information on unanticipated or temporary changes to components of, or hazards in, the National Airspace System (NAS). Component changes may pertain to infrastructure, facilities, services, procedures, or hazards in the NAS.

1.2.2 Providing information that becomes available too late to publicize in the associated aeronautical charts and related publications.

1.3 Improper Use of NOTAM System

NOTAMs should not be used to impose restrictions on airport access for the purpose of controlling or managing noise or to advertise data already published or charted.[1]

1.4 Extended Period NOTAMs.

In general, NOTAMs are intended to be issued for temporary and short-term conditions and should remain in effect for 90 days or less when possible. Should an airport need a NOTAM longer than 90 days, the airport operator should submit the NOTAM information to the Federal Aviation Administration (FAA) via the PERM NOTAM process in paragraph 2.3.13, to have the information published in an appropriate FAA publication(s) and/or chart(s). The originator of the NOTAM should cancel the PERM NOTAM promptly after the relevant information is published elsewhere by the FAA.

[1] After October 1, 1990, noise restrictions for airports are typically cleared through the FAA's notice and review process, as required by the Airport Noise and Capacity Act of 1990. The process for compliance with this law is set forth in 14 Code of Federal Regulations (CFR) Part 161, *Notice and Approval of Airport Noise and Access Restrictions.* Contact the Regional Offices (Safety and Standards Branch) for guidance on complying with 14 CFR Part 161.

1.5 Airport Records and Controls.

1.5.1 Airports certificated under Part 139 and federally obligated airports have requirements for maintaining records. Specifically, under 14 CFR 139.339(d), airport operators must maintain "for at least 12 consecutive calendar months, a record of each dissemination of airport condition information to air carriers prescribed by this section," including the dissemination of information using the NOTAM system for origination, modification, or cancelation of NOTAMs.

1.5.2 Airports may use information derived from the Federal NOTAM System (NOTAM Manager or E-NOTAM II (ENII), to create its own electronic archive of the system confirmation emails they receive when issuing, modifying, or cancelling a NOTAM. The airport operator is ultimately responsible for maintaining these records (as specified by Part 139) and therefore the Federal NOTAM System itself should only serve as a backup to the airport's primary method of record retention for purposes of demonstrating compliance with part 139 recordkeeping requirements.

1.5.3 A sample NOTAM log is provided in Appendix A. Airport operators can use this sample form as a template to ensure basic NOTAM information is captured, distributed, and archived, including air carrier notification. Airport operators can modify the form to meet unique requirements at their facilities.

1.5.4 The NOTAM status of an airport should be checked and recorded daily, or more often if necessary, especially during inclement weather conditions.

1.6 Responsibilities.

1.6.1 Airport Operators.

Airport operators have the following responsibilities under the FNS:

1.6.1.1 Making known, as soon as practicable, any condition, existing or anticipated, within five miles from the Airport Reference Point that will prevent, restrict, or present a hazard during the arrival or departure of aircraft. Local coordination with airport users such as air carriers and other commercial operations should be conducted as far in advance as possible to minimize the impact of construction projects, planned surface closures, or other conditions affecting operations on the airport.

1.6.1.2 Coordinating the issuance/cancellation of NOTAMs with the Air Traffic facility responsible for providing clearance to aircraft at the airport. This applies to both towered and non-towered airports and the coordination may include an enroute air traffic control facility (ARTCC), terminal radar approach control (TRACON) facility, Flight Service Station (FSS), or the airport traffic control tower (ATCT).

1.6.1.3 Reporting and updating airport field conditions, the condition of airport services, facilities, movement areas, parking areas, loading aprons, and

holding bays. Specific airport operator management responsibilities are outlined in Part 139, *Certification of Airports*; Part 152, *Airport Aid Program;* and Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports.*

Note: It is recommended that airport personnel operating on the airfield monitor the local traffic and air traffic frequencies. This will enable personnel to identify approaching aircraft, which may pose an operational safety risk, and allow time to avoid a conflict. For example, air traffic control and /or the pilots may not be aware of a runway closure at the non-towered airport. That is, sometimes a NOTAM is issued after an aircraft becomes airborne and the pilot did not receive the latest update, especially at an uncontrolled airport. The FAA recommends that NOTAMs for runway closures, snow removal operations, and any other lengthy maintenance activities at uncontrolled airports be directly coordinated with the overlying air traffic control facility (TRACON or ARTCC) when the operation will begin in less than 60 minutes.

1.6.1.4 Ensuring notifications are made no more than 7-days before an expected condition will occur. Public notification is accomplished through the NOTAM system. This same notification system should be used when the condition has been corrected or otherwise changed. Airport operators are also responsible for ensuring NOTAMs are current and cancelled when the conditions that prompted the NOTAMs no longer exist.

1.6.1.5 Acknowledging responsibility for facility components such as pavements, runway lights, and airport guidance sign systems. Other components, such as navigation facilities and approach lights, are usually the responsibility of the FAA. To avoid confusion, airport operators must initiate a NOTAM on a facility when its operation and maintenance are clearly within their area of responsibility. However, airport operators will make every effort to alert the responsible party when outages/discrepancies are observed for facilities that fall outside their area of responsibility.

1.6.1.6 Being aware, along with pilots, of Temporary Flight Restrictions (TFR) that may affect airport operations. TFR information is available at https://tfr.faa.gov/tfr2/list.html, 1800wxbrief.com, or by calling any FSS for a pilot briefing.

1.6.1.7 Keeping informed of NOTAM technology as advancements in NOTAM delivery capabilities change. Currently, the FAA web-based Digital NOTAM Manager is the preferred system for initiating NOTAMs. See paragraph 3.1.2. For information on obtaining NOTAM Manager or to access the FAA's NOTAM Manager Self-Cert program, please go to https://notams.aim.faa.gov/ and select "Applications".

Note: Whenever NOTAM modernization occurs, the FAA usually establishes a grace period during which the previous legacy system is phased out.

1.6.1.8 Keeping training programs up-to-date and maintained. As changes occur, airport staff must be trained on new processes and procedures, and training material must be updated, as provided under 14 CFR § 139.303.

1.6.1.9 Using the optional NOTAM Log (electronic or paper) in Appendix A or a downloaded history from the NOTAM Manager or ENII system, to be used as the primary or backup method for maintaining records of the origination, modification, cancellation, or tracking, of NOTAM activity, for purposes of demonstrating compliance with part 139 recordkeeping requirements.

1.6.1.10 Inputting Pilot Weather Report (PIREP) information into NOTAM Manager or E-NOTAMII, when received from aircraft operators or the ATCT, in order to assist in comparing PIREPs and airport operator condition assessments. See paragraph 3.12.2 for application.

1.6.1.11 Providing an up-to-date list of airport employees who are authorized to access and issue NOTAMs through NOTAM Manager, ENII, or to the FSS air traffic manager.

1.6.1.12 Respond to NOTAM inquiries from Regional Airport offices (Safety and Standards Branch), United States NOTAM Office (USNOF), and FSS or FSS representatives on matters pertaining to the NOTAM process.

1.6.1.13 Review and approve any NOTAMs which are expected to be in effect at the airport for 90 days or longer, for accuracy and necessity. NOTAMs associated with published information, which are intended to be a permanent change, should follow the PERM NOTAM process outlined in paragraph 2.3.13. The airport operator will need to monitor publishing dates to confirm the submitted information has been updated. Once the information has been published in an appropriate FAA publication or chart, the airport operator will need to cancel the corresponding NOTAM in the system.

Note: NOTAM information for permanent changes will not auto-cancel out of the NOTAM system when the alternate FAA publication is updated and requires action by the airport operator to be cancelled.

1.6.2 Flight Service.

Flight Services System Operations Services, Flight Services, is responsible for ensuring that data submitted for NOTAM origination complies with the policies, criteria, and formats contained in this AC and FAA Order 7930.2. This responsibility is delegated to the Safety and Operations Policy Group, which oversees the FSS and FSS representatives. If there are questions on the validity of a NOTAM, a FSS

representative will attempt to contact the airport operator. When there is no response from the airport operator after 30 calendar days of multiple contact attempts, (e.g., phone and email), then FSS will inform the appropriate FAA Regional Airport office of the issue for assistance.

1.6.3 Regional Offices (Safety and Standards Branch).

When requested by FSS, the regional office communicates with the airport operator to confirm if a NOTAM is still valid and, if needed, may ask the airport operator to submit a change to the FAA via the process in the PERM NOTAM paragraph 2.3.13.

1.6.4 U.S. NOTAM Office (USNOF).

The USNOF is responsible for NOTAM formatting compliance. NOTAMs submitted through the FNS must be in the proper format. (See paragraph 2.3 for proper NOTAM format.) To ensure NOTAMs are issued in accordance with NOTAM policy pursuant to FAA Order 7930.2, USNOF will:

1.6.4.1 Maintain the integrity of the NOTAM system by managing it for compliance 24/7/365.

1.6.4.2 Process, store, and distribute NOTAMs through the NOTAM system.

1.6.4.3 Provide quality control during the review, processing, and origination of NOTAMs.

1.6.4.4 Notify the transmitting party when the USNOF determines that NOTAM information submitted is not in compliance with the criteria or procedures.

1.6.4.5 Ensure NOTAM policy questions are forwarded to the US NOTAM Governance Team for decision-making in consultation with other interested program offices.

1.6.5 To submit a NOTAM policy questions, go to: https://www.faa.gov/air_traffic/flight_info/aeronav/aero_data/Aeronautical_Inquiries/

1.7 **Compliance.**

1.7.1 Certificated Airports.

The Office of Airport Safety and Standards is responsible for enforcing the airport operator responsibilities, as outlined in Part 139. Additionally, Office of Airport Safety and Standards has responsibility to collaborate with the USNOF on NOTAM criteria challenges and other concerns that will assist in improving the overall functionality and use of the NOTAM system.

1.7.2 Federally Obligated Airports.

The Office of Airport Compliance and Management Analysis is responsible for enforcing those responsibilities at all airports with federal obligations, which includes

federal property transfer requirements and grant assurances. For the general compliance requirements of federally obligated airports that are not certificated under Part 139, see Part 152, Appendix D, and the current FAA Order 5190.6. A fundamental obligation on the sponsor is to keep the airport open for public use. Grant Assurance 19, *Operation and Maintenance*, requires the sponsor to protect the public using the airport by adopting and enforcing rules, regulations, ordinances, or policies as necessary to ensure safe and efficient flight operations. This obligation includes the following:

1.7.2.1 **Field Lighting.**

If field lighting is installed, the sponsor must ensure the field lighting and associated airport beacon and lighted wind and landing direction indicators are operated every night of the year, or when needed. (See paragraph 7.12, Part-time Operation of Airport Lighting, in FAA Order 5190.6.) Properly maintaining marking, lighting, and signs can reduce the potential for pilot confusion and prevent a pilot deviation or runway incursion.

1.7.2.2 **Warnings.**

If any part of the airport is closed, or if the use of any part of the airport is hazardous, the sponsor must provide warnings to users by issuing NOTAMs.

1.7.2.3 **Safe Operations.**

The airport will be operated at all times in a safe and serviceable condition. The sponsor should adopt and enforce adequate rules, regulations, ordinances, or policies, as necessary, to ensure the safety and efficiency of aircraft operations and to protect the public using the airport. When a proposed action directly impacts the flight of an aircraft, that action should be coordinated with FAA Flight Standards and/or ATC.

1.8 Dissemination of NOTAMs.

1.8.1 Determining NOTAM Distribution.

The USNOF is charged with monitoring the FNS for compliance with the criteria and procedures set forth in policy. When questions arise about NOTAM dissemination, formats, contractions, or other aspects of the distribution system, consult the USNOF.

1.8.2 Domestic NOTAMs.

NOTAM (D) information is distributed for all public use airports, seaplane bases, and heliports listed in the Chart Supplement U.S. and all navigational facilities that are part of the NAS. The NOTAM (D) criteria of FAA Order 7930.2 requires wide dissemination of NOTAM (D) information via telecommunication and pertains to enroute navigational aids, facilities, services, and procedures, as listed in the Chart Supplement U.S.

1.8.3 Determining NOTAM Issuance Criteria.

1.8.3.1 NOTAMs should not be issued contrary to standards or guidance. This includes (but not limited to) NOTAMs with websites, commercial information, or non-safety critical changes.

1.8.3.2 The following examples typically would not meet criteria for issuance of a NOTAM, unless determined by the Office of Airports and the USNOF supervisory authority that it impacts safety:

1.8.3.2.1 The lack of ramp or apron marshalling services and road traffic control.

1.8.3.2.2 Activities such as parachuting, gliding, acrobatics, and training when conducted in uncontrolled airspace under Visual Flight Rules (VFR) conditions and when the activity is already published.

1.8.3.2.3 Electronic Navigational Aid (NAVAID) operating on or without emergency backup power or standby transmitter, except when applicable to Category (CAT) II/III Instrument Landing Systems (ILS).

1.8.3.2.4 When Air Traffic Services (ATS) are made available using contingency plans transparent to the users, such as call re-routing and remote monitoring.

1.8.3.2.5 Training activities by ground units (e.g., military operations at the airport).

1.8.3.2.6 Unavailability of back-up and secondary systems if these do not have an operational impact.

1.8.3.2.7 Announcement or warnings about possible/potential limitations without any operational impact.

1.8.3.2.8 General reminders on already published information.

1.8.3.2.9 Availability of equipment for ground units without containing information on the operational impact for airspace and facility users. (e.g., military operations at the airport).

1.8.3.2.10 Information about laser emissions without any operational impact or fireworks below minimum flying heights.

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Chapter 2. NOTAM Process

2.1 Authority to Initiate a NOTAM.

2.1.1 Airport operators are responsible for observing and reporting the condition of airport facilities when temporary changes or outages could impact the NAS. See 14 CFR § 139.339(c)(9) and Grant Assurance 19. Airport operators are also responsible for initiating NOTAMs to report runway condition assessments and field condition (FICON). See 14 CFR § 139.339(c)(9) and Grant Assurance 19. FICONs are used to report surface conditions and braking action on runways, taxiways, and aprons/holding bays. The Runway Condition Assessment Matrix (RCAM) is the assessment tool airport operators use to identify and report runway surface conditions into the FNS. See Appendix B.

2.1.2 All airport operators are responsible for providing an up-to-date list of airport employees who are authorized to issue NOTAMs to the FSS air traffic manager. See 14 CFR § 139.339(e). At public airports without an airport manager, the FSS air traffic manager will coordinate with the appropriate airport operating authority to obtain a list of persons delegated to provide NOTAM information. Using authorized airport personnel will help expedite NOTAM processing because information obtained from unauthorized personnel will have to be confirmed and authenticated by the FSS before a NOTAM will be issued.

2.1.3 Authorized airport personnel who do not have access to NOTAM Manager, ENII, or applicable FNS technology can submit information for NOTAMs to FSS.

2.1.4 The airport operator should execute and maintain a Memorandum of Agreement (MOA), which is required before using NOTAM Manager, between the airport operator and the FAA outlining procedures used for originating NOTAMs. The Aeronautical Services Group (AJM-336) will provide the MOA template to the parties involved.

2.2 NOTAM Criteria.

For airport operators awareness, FAA personnel tasked with accepting NOTAM information must use the official International Civil Aviation Organization (ICAO) contractions and abbreviations specified in FAA Order JO 7340.2 and the allowed exceptions found in FAA Order 7930.2 when composing NOTAMs. Plain language text is required when there is not an approved ICAO contraction.

2.2.1 Criteria for Publishing Airport NOTAMs.

NOTAMs may be published to address the following conditions or categories of information:

2.2.1.1 *Surface areas.* Changes in hours of operations and hazards such as pavement issues, wildlife conditions, surface conditions, airport

construction, airport infrastructure deficiencies, airspace obstruction, and other hazardous conditions.

2.2.1.2 *Public airports.* Commissioning, decommissioning, openings, closings, and abandonments.

2.2.1.3 *Aircraft Rescue and Fire Fighting (ARFF) capability.* Restrictions to air carrier operations.

2.2.1.4 *Changes to runway identifiers, dimensions, declared distances, threshold placements, and surface compositions.*

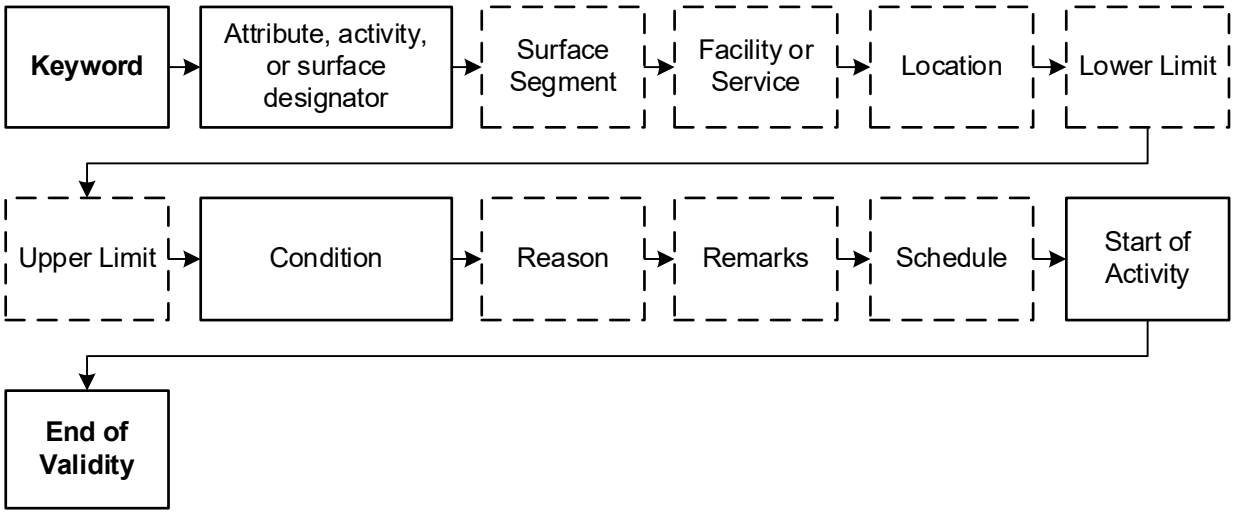
2.2.1.5 *NAS lighting systems.* Commissioning, decommissioning, outages, changes in classification or operation, as defined in AC 150/5340-30, *Design and Installation Details for Visual Aids.*

References: Aeronautical Information Manual (AIM), FAA Order JO 7930.2, and AC 120-57.

2.3 NOTAM Composition.

The purpose of the NOTAM diagram below is to provide a basic outline of the content of a NOTAM. The elements keyword, attribute, activity or surface designator; condition, start of activity, and end of validity are mandatory. All other elements are included, as needed. The paragraphs below provide some examples for each of the elements of the NOTAM composition.

Figure 2-1. Basic Outline of a NOTAM Content



2.3.1 Exclamation Point (!).

System-generated character that indicates the beginning of a NOTAM sentence.

Example: !

2.3.2 Accountability.

Affixed by the NOTAM system (the identifier of the accountability location; for example, JFK, FDC,).

Example: ! JFK

2.3.3 Location Identifier.

Location identifier for the facility the NOTAM will affect [the affected facility or location (airport, NAVAID, or Air Route Traffic Control Center (ARTCC)) appears after the NOTAM number]. Approach controls or airspace located within multiple ARTCC must have a separate NOTAM for each ARTCC.

Example: ! JFK JFK

2.3.4 Keyword.

See Table 2-1 for keywords and definitions.

Example: ! JFK JFK RWY

2.3.5 Attribute, Activity, or Surface Designator(s) (when needed).

A surface designator is required with keywords RWY, TWY, and APRON. Enter surface identification for runway-related NOTAMs, the taxiway identification for taxiway-related NOTAMs, or the apron identification for apron-related NOTAMs.

Note: If a facility component has not been given a specific identifying designation, such as an unnumbered or unlettered parking apron, associate it with a component that does have a positive identification.

Example: !JFK JFK RWY 04L/22R

Example: !JFK JFK TWY A, A1

Example: !JFK JFK APRON PRKG APN ADJ TWY A

2.3.6 Surface Segment (when needed).

Example: !JFK JFK TWY B BTN TWY C AND TWY D

Facility, feature, service, system, and/or components thereof (when needed).

Location description (when needed).

2.3.7 Lower Limit then Upper Limit or Height (when needed).

Specify the limits as follows:

2.3.7.1 For Surface (SFC), use 1 to 17,999 with the unit of measurement (above ground level (AGL) or mean sea level (MSL)). For example, 50FT, 1275FT AGL, 10500FT MSL.

2.3.7.2 For 18,000 feet and above, express in flight levels (FL). For example, FL180, FL550, or UNL (unlimited; altitudes greater than 99,900 feet).

2.3.7.3 Heights AGL may be added when required or when MSL is not known. For example, SFC-450FT AGL.

2.3.8 Condition.

Identify the changed condition or status being reported, when needed. When the conditions include a limitation or an exception, follow the condition with "TO" or "EXC". For example, "CLSD EXC SKI" or "CLSD TO TRANSIENT" OR "CLSD EXC TAX BTN APCH END RWY 10 AND TWY C".

Example: !JFK JFK RWY 12/30 CLSD

Example: !JFK JFK TWY A, A1 EDGE LGT U/S

2.3.9 Reason (when needed).

2.3.10 Remarks (when needed). Other information.

This identifies other information considered important to the pilot.

2.3.11 Schedule (when needed).

2.3.11.1 A NOTAM may be originated for a scheduled condition/activity that will occur during the period. Specify the schedule between the condition/activity and the valid time string using the universal coordinated time (UTC). To ensure NOTAM system compatibility, the days of the week must be specified before the scheduled time. The term "DLY" (daily) indicates the event will occur each day at the same time during the stated time period. The start time of the schedule must correspond to the start of activity time. The end of the last schedule must correspond to the end of validity time. For example: DLY 1200-2000 YYMMDD1200-YYMMDD2000; MON WED 0900-1300 YYMMDD0900-YYMMDD1300, TUE THU 0900-2000 YYMMDD0900-YYMMDD2000.

2.3.11.2 If the active time of a NOTAM corresponds to sunrise or sunset, the actual times of sunrise on the first day of validity and of sunset on the last day of validity must be used.

Example: ! JFK JFK RWY 12/30 CLSD DLY 1400-0100

Example: ! JFK JFK RWY 12/30 CLSD MON WED FRI 1730-2130

Example: ! JFK JFK RWY 12/30 CLSD MON-FRI 0900-2359

2.3.12 Start of Activity/End of Validity.

2.3.12.1 This is a 10-digit date/time group (YYMMDDHHMM) used to indicate the time at which the NOTAM comes into force (the date/time a condition will exist or begin) and the time at which the NOTAM ceases to be in force and becomes invalid (the expected return to service, return to normal status time, or the time the activity will end). To ensure NOTAM system compatibility, these times must be separated by a hyphen "-".

Example: ! JFK JFK RWY 12/30 CLSD YYMMDD2330-YYMMDD1300

2.3.12.2 When the NOTAM duration is certain, it should be reflected with a self-cancelling expiration time.

Example: ! JFK JFK RWY 12/30 CLSD YYMMDD2330-YYMMDD1300

2.3.12.3 When the NOTAM duration is citing a condition that is expected to return to service at an estimated period of time, it should reflect the estimated nature of the time with the suffix "EST".

Note: Any NOTAM that includes an "EST" must be cancelled or replaced before the NOTAM reaches its End of Validity time. If the NOTAM is not cancelled or replaced, it will expire at the end of validity time regardless of EST.

Example: !JFK JFK RWY 12/30 CLSD YYMMDD2330-YYMMDD1300EST

2.3.12.4 When a NOTAM advertises a permanent condition that will be published in text, chart, or database, insert "PERM" as the expiration date in lieu of a 10-digit date-time group. The NOTAM originator is responsible for canceling the NOTAM and ensuring the NOTAM data gets published in the appropriate publication. See PERM NOTAM information in paragraph 2.3.13.

Example: !JFK JFK RWY 12/30 CLSD YYMMDD2330-PERM

2.3.12.5 NOTAMs will auto-expire at the end of validity unless PERM is indicated.

2.3.12.6 When the condition of a number of facilities, NAVAIDs, services, or landing areas/runways are related to the same event (for example, date/time, facility closing, part-timing, runway closures, etc.), issue separate NOTAMs for each facility.

2.3.12.7 Each NOTAM concerning a specific aid, service, or hazard should be a complete report including all deviations unless reference is made to other restrictions already published.

2.3.12.8 If information is published elsewhere and is still valid, make references to that publication with the statement, "PLUS SEE (publication)." A NOTAM issued not stating "PLUS SEE (publication)" indicates the NOTAM replaces previously published similar data.

2.3.13 PERM NOTAMs Publication Process.

2.3.13.1 PERM NOTAMs are NOTAMs issued for airport facilities, features, or infrastructure alerting users of a permanent condition and that a NOTAM will be in effect until the information is published in an appropriate FAA publication(s) and/or chart(s).

2.3.13.2 When a NOTAM is originated for a permanent change to published aeronautical information, "PERM" must be inserted in lieu of a ten-figure date-time group end of validity time.

2.3.13.2.1 When issuing a PERM NOTAM, the originator must also submit the required information through the publication process.

2.3.13.2.2 The originator should enter a temporary NOTAM until they are able to confirm the initiation of the publication process.

2.3.13.3 Generally, PERM NOTAMs should not exceed a period of 90 days.

2.3.13.4 Obstacle NOTAMs should not be issued as PERM. To initiate the publication process of obstacles, contact the FAA Obstacle Data Team at 9-ajv-532-obstdata-req@faa.gov.

2.3.13.5 Once PERM information is published or charted, the PERM NOTAM should be immediately cancelled.

2.3.13.6 A PERM NOTAM for wildlife hazards should not be issued if the information is already published in the remarks section of the Airport Master Record or Chart Supplement.

2.3.13.6.1 PERM NOTAMs for wildlife activity can be issued, if it is new permanent wildlife information.

2.3.13.6.2 Immediate action should be pursued to publish new information or activity in the appropriate FAA publication.

2.3.13.7 A flowchart diagram at Appendix D illustrates what tools can be used to complete the PERM NOTAM process and which tool is the preferred method for accepting certain airport information. Additionally, the following link can be accessed for addressing PERM NOTAMs: https://www.faa.gov/air_traffic/flight_info/aeronav/aero_data/Submitting_Data/. Once the PERM NOTAM is issued, follow the process specified

below to publish the information in appropriate FAA charts or Chart Supplement:

2.3.13.7.1 Airport Data Information Portal (ADIP).

NOTAM information dealing with airport 5010 data changes can be submitted through this application to receive Regional Airport Offices (Safety and Standards Branch) approval. Typically, the Regional Airport Offices (Safety and Standards Branch) concurrence on the airport name change is needed before submitting the name change through ADIP. In addition, declared distances, wildlife, and any other 5010 data changes should be submitted through ADIP.

2.3.13.7.2 Aeronautical Information Portal (AIP).

The remainder of PERM NOTAM changes can be submitted by the airport operator or Regional Airport Offices (Safety and Standards Branch) to the AIP as either a chart or data change. If it is not a 5010 data change, then AIP should be used. The following website provides access to AIP: https://nfdc.faa.gov/nfdcApps/.

2.3.13.7.3 Aeronautical Chart Change (ACC).

NOTAM for taxiway changes, closed, or any other information that impacts the airport diagram will be submitted to the ACC Portal.

2.3.13.7.4 Aeronautical Data Changes (ADC).

NOTAMs for any other data changes that do not go through ADIP are sent through the ADC.

Table 2-1. NOTAM Keywords / Definitions

Keyword	Definition
AD **(Aerodrome)**	Used to describe a temporary change or hazard or potential hazard on or within 5 statute miles of an airport, heliport, or maneuvering area that is not associated with a specific movement area surface. Such hazards may include aerodrome closures, lighting not associated with a specific movement area surface, aerodrome services (fuel, customs, ARFF), helicopter platforms, wildlife hazards, and meteorological equipment (wind indicators) or services. **Note:** When using AD, ensure it is accompanied by the acronym for Airport (AP) if a complete aerodrome closure is implied.
APRON	Used to describe a temporary change or hazard associated with an apron, ramp or taxi lane, lighting, markings, helipad, signage and other attributes associated with a specific apron.
COM **(Communications)**	Used to describe a temporary change or hazard caused by communication outlet commissioning, decommissioning, outage, unavailability, and air-to-ground frequencies. **Note:** Airport operators may not have rights to submit NOTAMs using this keyword.
NAV **(Navigation Aids)**	Used to describe a temporary change or hazard caused by changes in the status of ground-based radio navigational aids and Global Navigation Satellite Systems (GNSS) (except for area navigation (RNAV) approach anomalies). **Note:** Airport operators may not have rights to submit NOTAMs using this keyword.
OBST **(Obstructions, including obstruction lighting outages)**	Used to describe a temporary change or hazard caused by a moored balloon, kite, tower, crane, stack, obstruction, obstruction lighting outage, obstruction status, or telecommunication tower light outage.
RWY (Runway)	Used to describe a temporary change or hazard associated with landing and takeoff surfaces to include runway lighting, signage, and other airport services or attributes associated with a specific runway. Identify runways with the prefix RWY followed by the magnetic bearing indicator, e.g., RWY 12/30, RWY 12, or RWY 30.
TWY (Taxiway)	Used to describe a temporary change or hazard associated with a taxiway, taxiway lighting, markings, helipads, signage, and other attributes associated with a specific taxiway. Applies to single or multiple taxiways. Identify taxiways with the prefix TWY followed by the taxiway identifier letter or letter/number as assigned, e.g., TWY C, B3 CLSD, TWY PARL TWY ADJ RWY 09/27 CLSD.
SVC **(Services)**	Used to describe a temporary change or hazard associated with change in service levels, such as operating hours, air traffic management services, or airport services.

2.3.14 NOTAM examples and translations. The paragraphs below provide some examples for various categories and plain text translations illustrating the structure of certain keyword NOTAMs. NOTAMs will not always contain all of the NOTAM composition elements.

2.3.14.1 **Runway.**

…RWY 09/27 CLSD TO ACFT MORE THAN 12500LB YYMMDD1300-YYMMDD2000

Translation: Runways 09 and 27 are closed to all aircraft weighing more than 12,500 pounds during the time period specified.

…RWY 13/31 CHANGED TO RWY 14/32 YYMMDD1200-PERM

Translation: Runway designation 13/31 now permanently changed to 14/32.

…RWY 16/34 CLSD TO ACFT WINGSPAN MORE THAN 70FT AND TO ACFT TAIL HEIGHT MORE THAN 49FT YYMMDD1300−YYMMDD2000

Translation: Runways 16 and 34 are closed to aircraft with a wingspan more than 70 feet and is also closed to aircraft with a tail height more than 49 feet during the specified time period.

2.3.14.2 **Taxiway.**

…TWY A3, A4, A5 EDGE LGT U/S YYMMDD1800-YYMMDD2200

Translation: Taxiway(s) A3, A4, and A5 taxiway edge lights are out of service during the specified time period.

…TWY ALL CLSD YYMMDD1800-YYMMDD2200

Translation: All taxiway(s) are closed during the time period specified.

…TWY A WIP ELECTRICAL LINE TRENCHING YYMMDD0800-YYMMDD1400

Translation: Taxiway A has work in progress for electrical line trenching for a specific time period.

2.3.14.3 **Aprons/Holding Bay.**

… APRON NORTH APN E 50FT CLSD YYMMDD2150-YYMMDD0700

Translation: The east 50 feet of the north apron is closed during the specified time period.

…APRON SOUTH CARGO APN CLSD YYMMDD1300-YYMMDD1300EST

Translation: South cargo apron is closed during the specified time period with an estimated return to service time.

2.3.14.4 **Spots, Gates, Hardstands, Etc.**

Can be used as geographical reference points to delineate a section on aprons or taxiways, but do not meet NOTAM criteria as its own individual "attribute".

…APRON SOUTH TERMINAL RAMP APN BTN GATE 3 AND SPOT 4 CLSD YYMMDD1300 – YYMMDD1300EST

Translation: South terminal ramp apron is closed during the specified times between gate 3 and spot 4 with an estimated return to service time.

…APRON EAST TERMINAL RAMP APN BTN SPOT 23 AND HARDSTAND 4 CLSD YYMMDD0900 – YYMMDD2300

Translation: East terminal ramp apron is closed during the specified times between spot 23 and hardstand 4.

2.3.14.5 **Aerodrome.**

*…AD AP CLSD YYMMDD2330-PERM (**Note:** See paragraph 2.3.13 for the PERM NOTAM process before issuing a PERM NOTAM.)*

Translation: Airport is now permanently closed.

…AD AP CLSD EXC 2HR PPR MON-FRI YYMMDD1000-YYMMDD1200

Translation: Airport closed except for two hours prior permission required for days of week and timeframe given.

2.3.14.6 **Services.**

…SVC ATIS NOT AVBL YYMMDD1600-YYMMDD1800

Translation: ATIS is not available for an established time period.

…SVC TWR CLSD YYMMDD2100-YYMMDD2300

Translation: Airport tower is closed for an established time period.

2.4 NOTAM Submission.

Airport operators should use NOTAM Manager as the preferred and most effective method for entering NOTAMs into the system. See paragraph 3.1.2. NOTAM Manager uses dropdown menus, which standardizes entry and improves consistency. It

also reduces or eliminates time-consuming free form NOTAMs that need human intervention and interpretation before issuing.

2.4.1 Connecting to NOTAM Manager.

2.4.1.1 Contact the National Airspace System Integration Support Contract (NISC) NOTAM Manager Deployment Team at 816-329-2550.

2.4.1.2 Register online at https://notams.aim.faa.gov/scert and a member of the NISC NOTAM Manager Deployment Team will contact you once your registration is received.

2.4.2 Using Other Methods to Issue NOTAMs.

2.4.2.1 Contact the appropriate Air Traffic facility for your airport if you encounter difficulty in contacting the FSS identified in the Chart Supplement.

2.4.2.2 FSS facility managers are required to ensure that lists of airport employees authorized to issue NOTAMs are available and kept current. To avoid delays in NOTAM dissemination, you must keep your airport's list of authorized personnel up-to-date as changes occur, but not less than once annually.

2.5 Verification Information.

2.5.1 When issuing a NOTAM via the FSS, provide the name, position, title (if appropriate), address, and telephone number of a responsible airport official who the FSS should contact if confirmation of the NOTAM information is required. If you call in your NOTAM, you should ask for the operating initials of the FSS specialist who receives your call and the number assigned to the NOTAM. Allow sufficient time for the FSS specialist to format and input the NOTAM into the NOTAM system. Call the FSS back to get the current NOTAM and NOTAM number. Each specialist is officially identified in the facility by operating initials. Knowing the initials and NOTAM number will make follow-up or other reference easier.

2.5.2 Airport personnel can review their NOTAMs on the FAA website at https://notams.aim.faa.gov/notamSearch/

2.6 NOTAM Management.

Consistent with the requirement to disseminate airport condition information to air carriers in 14 CFR § 139.339, airport operators are responsible for issuing NOTAMs as well as updating NOTAMs when the underlying condition has changed, or promptly cancelling NOTAMs that are no longer applicable to airport conditions.

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Chapter 3. Airport Condition NOTAMs and Reporting Process

3.1 Reporting Tools.

3.1.1 The airport operator is responsible for using all available methods, tools, and procedures to ensure timely and accurate information is being provided about airport conditions. See 14 CFR § 139.339. The airport operators should utilize the FNS as the primary method for collection and dissemination of airport information to aircraft operators and other airport users.

3.1.2 When disseminating airport condition information there are three methods available to airport operators. The first and preferred method is NOTAM Manager, a digital, direct-entry system. The second alternative method is the ENII system. The third method to issue a NOTAM is via telephone. This method is the least preferred due to the amount of time required to communicate airfield conditions to Flight Service, and the manual recording of notifications and disseminations in airport logs.

Note: If supplemental or secondary systems are used, the airport operator should ensure they are compatible and consistent. See 14 CFR § 139.339(b). Supplemental systems used for dissemination of NOTAM information are not recommended due to the potential to advertise outdated information which may be in conflict with current NOTAMs.

3.2 Reporting Conditions.

3.2.1 Use the term "DRY" to describe a surface that is neither wet nor contaminated. A FICON NOTAM should not be originated for the sole purpose of reporting a dry runway. See 14 CFR § 139.339(c)(3). A dry surface is reported when there is a need to report conditions on the remainder of the surface.

3.2.2 Use the term "WET" to describe a surface that is neither dry nor contaminated but has visible dampness, moisture, and/or water 1/8 inch (3mm) depth or less. Wet can also be reported as a stand-alone contaminant and in conjunction with other contaminants.

3.2.3 Use the word "REMAINDER" to provide additional information about the surface condition. For example, the runway surface conditions vary significantly according to the width, on one third of the runway, or a runway has been treated, resulting in differing field conditions on the untreated parts of the surface.

3.2.4 When assessing runway conditions, the airport operator should be aware that information reported will need to be divided into thirds, which represent the Touchdown, Midpoint, and Rollout portions of the runway. The conditions are reported based on the direction of the assessment, and typically correlates with the runway end in use.

3.2.5 The issuance of a Runway Condition Code (RwyCC) NOTAMs applies as follows:

3.2.5.1 RwyCC NOTAMs are not allowed on a runway with an active closure NOTAM in effect. This prevents any confusion on whether the runway is open or not.

3.2.5.2 The issuance of multiple RwyCC NOTAMs for the same runway, e.g., one for each end, is also not permitted. This prevents confusion about which runway direction is available and what the conditions are on the surface for that particular landing runway.

3.2.5.3 RwyCCs can be read in reverse for situations permitting opposite direction landing.

3.3 **Reportable Contaminants.**

3.3.1 The listed contaminants are those recognized and used for reporting purposes. The application and order of precedence is illustrated on the Runway Condition Assessment Matrix (RCAM). When reporting a runway condition, a depth is mandatory, and only included, with those contaminants marked by an asterisk (*).

- Wet (water 1/8 inch depth or less)
- Water* (greater than 1/8 inch depth)
- Frost
- Slush*
- Ice
- Wet ice
- Water* over ice
- Wet snow*
- Wet snow* over ice
- Dry snow*
- Dry snow* over ice
- Compacted snow
- Water* over compacted snow
- Wet snow* over compacted snow
- Dry snow* over compacted snow
- Slush* over Ice
- Slippery When Wet
- Mud*
- Oil

- Sand
- Ash

3.3.2 A wet contaminant can have an impact on the performance of some aircraft; therefore, the FAA highly encourages airports to report "Wet" conditions (1/8 inch depth or less of water) when it is the only condition present on the runway. Equally important, the airport operator must be aware of its responsibility to monitor conditions during periods of heavy rainfall, which may cause depths to increase to greater than 1/8 inch of water (even on grooved runways). Airplane operators indicate this is critical information to report given the impact on airplane performance. Airport operators must report "Wet" conditions when associated with other winter contaminants in any particular third of the runway. See 14 CFR 139.339(c)(3). Additionally, when a runway has been treated with chemicals to mitigate a specific contaminant and the resulting surface is now "Wet", this condition should be reported. The airport also has the option to report the chemical treatment within the same NOTAM.

Table 3-1. Reportable Contaminant Definitions

Term	Definition
Contaminant	A deposit (such as frost, any snow, slush, ice, or water,) on an aerodrome pavement where the effects could be detrimental to the friction characteristics of the pavement surface.
Contaminated runway	For purposes of condition reporting and airplane performance, a runway is considered contaminated when more than 25 percent of the runway surface area (within the reported length and the width being used) is covered by frost, ice, and any depth of snow, slush, or water. **Note:** While ash, sand, oil, and rubber (see "Slippery When Wet" definition) are reportable contaminants, there is no associated airplane performance data available, and a depth would not be reported.
Ash	A grayish white to black soft solid residue of combustion normally originating from pulverized particulate matter ejected by volcanic eruption.
Compacted snow	Snow that has been compressed and consolidated into a solid form that resists further compression such that an airplane will remain on its surface without displacing any of it. If a chunk of compressed snow can be picked up by hand, it will hold together or can be broken into smaller chunks rather than falling away as individual snow particles.
Dry runway	A runway is dry when it is neither wet, nor contaminated. For purposes of condition reporting and airplane performance, a runway can be considered dry when no more than 25 percent of the runway surface area (within the reported length and the width being used) is covered by visible moisture or dampness, frost, slush, snow (any type), or ice.

Term	Definition
Dry snow	Snow that has insufficient free water to cause it to stick together. This generally occurs at temperatures well below 32 degrees F (0 degrees C). If when making a snowball, it falls apart, the snow is considered dry.
Frost	Frost consists of ice crystals formed from airborne moisture that condenses on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture.
Ice	The solid form of frozen water.
Layered contaminant	A combination of the definitions for each of the contaminants. For example, the definition of “Wet Snow over Ice” is “Snow that has grains coated with liquid water, which bonds the mass together, but that has no excess water in the pore space” over “the solid form of frozen water.”
Mud	Wet, sticky, soft earth material.
Oil	A viscous liquid derived from petroleum or synthetic material, especially for use as a fuel or lubricant.
Rubber	A tough elastic polymeric substance made from the latex of a tropical plant or from synthetic material.
Sand	A sedimentary material, finer than a granule and coarser than silt.
Slippery when wet	A wet runway where the surface friction characteristics would indicate diminished braking action as compared to a normal wet runway.
Slush	Snow that has water content exceeding a freely drained condition such that it takes on fluid properties (e.g., flowing and splashing). Water will drain from slush when a handful is picked up. This type of water-saturated snow will be displaced with a splatter by a heel and toe slap-down motion against the ground.
Slush Over Ice	Snow that has water content exceeding a freely drained condition such that it takes on fluid properties (e.g., flowing and splashing) over the solid form of frozen water.
Water	Water in a liquid state. For purposes of condition reporting and airplane performance, water is greater than 1/8 inch (3 mm) in depth.
Wet ice	Ice that is melting or ice with any depth of water on top.
Wet runway	A runway is wet when it is neither dry, nor contaminated. For purposes of condition reporting and airplane performance, a runway can be considered wet when more than 25 percent of the runway surface area (within the reported length and the width being used) is covered by any visible dampness or water that is 1/8 inch (3 mm) or less in depth.
Wet snow	Snow that has grains coated with liquid water, which bonds the mass together, but that has no excess water in the pore space. A well-compacted, solid snowball can be made, but water will not squeeze out.

3.4 **Reportable Depths.**

Specify the estimated contaminant depth in inches and feet.

Table 3-2. Reportable Depth Measurements

Use Value	To Report
1/8IN	1/8 inch or less
1/4IN	> 1/8 inch to and including 1/4 inch
1/2IN	> 1/4 inch to and including 1/2 inch
3/4IN	> 1/2 inch to and including 3/4 inch
1IN	> 3/4 inch to and including 1 inch

3.4.1 When 1 inch is reached, report values in multiples of 1 inch and discontinue the use of fractions. When a snow depth of 35 inches is reached, report values in multiples of feet. Round depths greater than 1 inch to the next higher reportable depth.

3.4.2 Report the highest depth of the contaminant along the reported portion of the surface.

3.4.3 The runway contaminants for which depth is mandatory when reporting runway surface conditions are specified in paragraph 3.3. The contaminant depth should also be reported for taxiway and apron/ramp conditions using the same reference paragraph.

3.5 **Reporting Runway Percentage.**

Percent coverage (PRCT) is used to represent an *approximate* coverage on a runway. It is used in conjunction with contaminant type and depth. Percent coverage also plays a major role in the application of the RCAM and the calculation of RwyCCs. As indicated by the range of percentages, it should be noted that the reported percent value is not intended to be an exact measurement. The value reported, should be a conservative estimate.

Note: Percentages only apply to runways, not any other surface.

Table 3-3. Reporting Runway Percentage

Percent Range	Percent Reportable
10% or less	10%
11% to 20%	20%
21% to 25%	25%
26% to 30%	30%
31% to 40%	40%

Percent Range	Percent Reportable
41% to 50%	50%
51% to 60%	60%
61% to 70%	70%
71% to 75%	75%
76% to 80%	80%
81% to 90%	90%
91% to 100%	100%

3.6 Runway Condition Assessment Matrix (RCAM).

Upon completing an assessment of a runway surface, the next step is determining how the RCAM applies. The threshold for determining RwyCC applicability is 25%. The airport operator must first determine whether the overall runway length and width is contaminated greater than 25%. If the contaminant noted is greater than 25%, RwyCCs will be applicable. If 25% or less of the runway is contaminated, then a RwyCC will not be generated.

3.6.1 Using the Runway Condition Assessment Matrix (RCAM).

The RCAM is the method an airport operator uses to assess and report conditions on a runway surface when contaminants are present. Use of the RCAM is only applicable to paved runway surfaces. Once an assessment has been performed, the RCAM defines the format by which the airport operator reports and determines a Runway Condition Code "RwyCC" (when applicable). This function is automatically calculated in the FNS. Below are the basic steps for obtaining a RwyCC and some examples of how it will appear as a NOTAM. Consult AC 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*, for current guidance for assessing and reporting airport surface conditions using the RCAM.

3.6.2 Determining Runway Condition Codes (RwyCC).

Upon identifying that a runway is contaminated greater than 25%, use the RCAM (Appendix B) to determine the type of contaminant present. Upon selecting the appropriate type of contaminant, assign the corresponding RwyCCs based upon the RCAM and the following criteria. Once the RwyCCs have been assigned, the airport operator may elect to downgrade the assigned RwyCCs, based upon observations and judgment. Conversely, the airport operator may also upgrade RwyCCs in limited scenarios, when specific criteria are met, as detailed below.

Note: The **bolded contaminants** in some of the runway third diagrams below take precedence in determining the RwyCC for that third.

3.6.2.1 **Single Contaminant Criteria.**

1. If a runway third contains a single contaminant that is *greater than 25%*, the RwyCC for that third is based directly on the code associated with that contaminant.

Runway Third:	Touchdown	Midpoint	Rollout
RwyCC:	5	5	5
Contaminant:	70% 1/8 inch Wet Snow	70% 1/8 inch Wet Snow	70% 1/8 inch Wet Snow

04 22

2. If a runway third contains a single contaminant that is *less than or equal to 25%*, the RwyCC for that third will be a RwyCC of "6". This is due to the runway condition being primarily Dry (or greater than 25%).

Runway Third:	Touchdown	Midpoint	Rollout
RwyCC:	6	6	6
Contaminant:	20% 1/8 inch Wet Snow	20% 1/8 inch Wet Snow	20% 1/8 inch Wet Snow

04 22

3.6.2.2 **Multiple Contaminants Criteria.**

1. When two contaminants are present in a runway third and the percent coverage for at least one of the contaminants is *greater than 25%*; the RwyCC for that third will be based on the contaminant with the lowest RCAM code that has a percent coverage *greater than 25% in that third.*

Runway Third:	Touchdown	Midpoint	Rollout
RwyCC:	2	2	2
Contaminant:	20% 1/8 inch Wet Snow **30% 1/4 inch Slush**	20% 1/8 inch Wet Snow **30% 1/4 inch Slush**	20% 1/8 inch Wet Snow **30% 1/4 inch Slush**
	Total Coverage 50%	Total Coverage 50%	Total Coverage 50%

04 22

Runway Third:	Touchdown	Midpoint	Rollout
RwyCC:	1	1	1
Contaminant:	**30% Ice** 60% **1/4** inch Slush	**30% Ice** 60% **1/4** inch Slush	**30% Ice** 60% **1/4** inch Slush
	Total Coverage 90%	Total Coverage 90%	Total Coverage 90%

04 22

2. When two contaminants are present in a runway third and the percent coverage for each individual contaminant is *less than or equal to 25%*

(and the total coverage for that runway third is greater than 25%); the RwyCC for that third will be based on the contaminant with the higher percentage for that third.

Runway Third:		Touchdown	Midpoint	Rollout	
RwyCC:		2	2	2	
Contaminant:	04	10% Ice **20% 1/4 inch Slush**	10% Ice **20% 1/4 inch Slush**	10% Ice **20% 1/4 inch Slush**	22
		Total Coverage 30%	Total Coverage 30%	Total Coverage 30%	

3. When two contaminants are present in a runway third and the percent coverage for each individual contaminant is *equal* and the total coverage for that runway third is *greater than 25%*, the RwyCC for that third will be based on the contaminant with the lowest RCAM value (if the RCAM values are not equal).

Runway Third:		Touchdown	Midpoint	Rollout	
RwyCC:		1	1	1	
Contaminant:	04	**20% Ice** 20% 1/4 inch Slush	**20% Ice** 20% 1/4 inch Slush	**20% Ice** 20% 1/4 inch Slush	22
		Total Coverage 40%	Total Coverage 40%	Total Coverage 40%	

4. When two contaminants are present in a runway third and the total percent coverage for that runway third is less than or equal to 25%, the RwyCC for that third will be a RwyCC of "6". This is due to the runway condition being primarily Dry (or greater than 25%).

Runway Third:		Touchdown	Midpoint	Rollout	
RwyCC:		6	6	6	
Contaminant:	04	10% Ice 10% 1/4 inch Slush	10% Ice 10% 1/4 inch Slush	10% Ice 10% 1/4 inch Slush	22
		Total Coverage 20%	Total Coverage 20%	Total Coverage 20%	

3.6.3 Downgrade of RwyCC.

The airport operator may downgrade a RwyCC when Continuous Friction Measuring Devices (CFME)/deceleration devices, pilot reports, or other observations suggest conditions are worse than indicated by the contaminant present. The airport operator should exercise good judgment and, if warranted, report a lower RwyCC than the contamination type and depth would indicate when generating an initial RwyCC. The NOTAM system has prompts and built-in protocols that must be addressed before completing a downgrade action.

3.6.4 Upgrade of RwyCC.

Generally, the FAA does not recommend that the airport operator upgrade a RwyCC from what is defined by the RCAM. Given the friction variability of certain contaminants, there are circumstances when a RwyCC of "0" or "1" (Ice, Wet Ice, Slush over Ice, Water over Compacted Snow, or Dry/Wet Snow over Ice) may not be as slippery as the RwyCC generated by the RCAM. In these very specific circumstances, the airport operator may upgrade the RwyCC to no higher than a RwyCC of "3". The NOTAM system has prompts and built-in protocols that must be satisfied before completing an upgrade action. Specific information for both the downgrade and upgrade instructions can be found in AC 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety.*

Note: When contaminants which are not listed in RCAM are reported individually, or combined with contaminants listed in the RCAM, a RwyCC should not be generated. This function is automatic within the NOTAM System. Additionally, this criteria will not be used for Nil pilot reported braking action reports.

3.7 Examples of System Capabilities Associated Field Condition (FICON) NOTAMs.

In the examples of a FICON NOTAM shown below, the first example includes all elements for a particular surface. Subsequent examples for that surface begin with a keyword and end prior to the scheduled time, unless including that information is helpful for clarity. Any translation will follow the same guideline. The following examples illustrate the systems capability to report varying complexities associated with runway conditions.

3.7.1 Uniform Coverage for All Runway Thirds.

!ORD ORD RWY 04L FICON 5/5/5 50 PCT 1/8IN DRY SN OBSERVED AT YYMMDD1620. YYMMDD1625-YYMMDD1625

Translation: Chicago O'Hare airport assessment using the RCAM produced a RwyCC of 5/5/5 with uniform contaminant coverage of 50% 1/8 inch dry snow on all thirds of the runway. Since there is uniform coverage for all runway thirds, the NOTAM will illustrate just the 50% coverage, depth, and type to show uniform coverage and the valid times.

Runway Third:	Touchdown	Midpoint	Rollout
RwyCC:	5	5	5
Contaminant:	50% 1/8 inch Dry Snow	50% 1/8 inch Dry Snow	50% 1/8 inch Dry Snow

04L 22R

3.7.2 A Single But Different Contaminant Exists In Each Runway Third.

!DEN DEN RWY 25 FICON 5/3/5 50 PCT WET, 50 PCT 1/8IN WET SN OVER COMPACTED SN, 50 PCT 1/8IN SLUSH OBS AT YYMMDD1655. YYMMDD1700- YYMMDD2000

Translation: Denver airport assessment using the RCAM produced a FICON of 5/3/5 with contaminants consisting of 50% Wet, 50% 1/8in Wet Snow over Compacted Snow, and 50% 1/8in Slush. The overall coverage is more than 25% of the entire length and width so a RwyCC was generated for each third based on contaminant types and depths. With the addition of valid times, this becomes the NOTAM sentence.

Runway Third:		Touchdown	Midpoint	Rollout	
RwyCC:		5	3	5	
Contaminant:	**25**	50% Wet	50% 1/8 inch Wet Snow over Compacted Snow	50% 1/8 inch Slush	**07**

3.7.3 Two Different Contaminants in Each Runway Third.

!SLC SLC RWY 34L FICON 3/5/2 50 PCT WET AND 50 PCT 1/8IN WET SN OVER COMPACTED SN, 50 PCT WET AND 25 PCT 1/8IN WET SN OVER COMPACTED SN, 10 PCT 1/4IN SLUSH OVER ICE AND 75 PCT 1/4IN SLUSH OBS AT YYMMDD1855. YYMMDD1900-YYMMDD2200

Translation: Salt Lake City airport assessment using the RCAM produced a FICON of 3/5/2 with contaminants consisting of 50% Wet and 50% 1/8in Wet Snow over compacted Snow, 50% Wet and 25% 1/8in Wet Snow over compacted Snow, 10% 1/4 inch Slush over Ice and 75% 1/4 inch Slush. The overall coverage is more than 25% of the entire length and width so a RwyCC was generated for each third based on contaminant type and depth. With the addition of valid times, this becomes the NOTAM sentence.

Runway Third:		Touchdown	Midpoint	Rollout	
RwyCC:		3	5	2	
Contaminant:	**34L**	50% Wet **50% 1/8 inch Wet Snow over Compacted Snow**	**50% Wet** 25% 1/8 inch Wet Snow over Compacted Snow	10% 1/4 inch Slush over Ice **75% 1/4 inch Slush**	**16R**
		Total Coverage 100%	Total Coverage 75%	Total Coverage 85%	

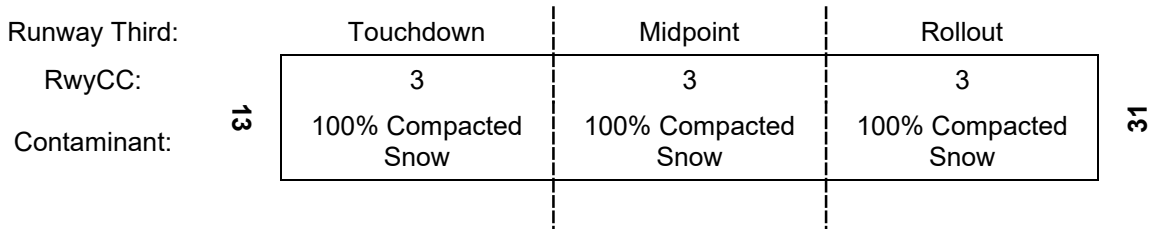
3.7.4 Runway FICON.

!LGA LGA RWY 13 FICON 3/3/3 100 PCT COMPACTED SN OBS AT YYMMDD0230. COND NOT MNT YYMMDD0300-YYMMDD1045.

Translation: LaGuardia airport Runway 13 is the landing runway and has a Runway Condition Code of "3" in all thirds and is 100% covered by compacted snow. The temperature is warmer than 5°F (-15°C). The field conditions are not monitored during a specified timeframe as illustrated.

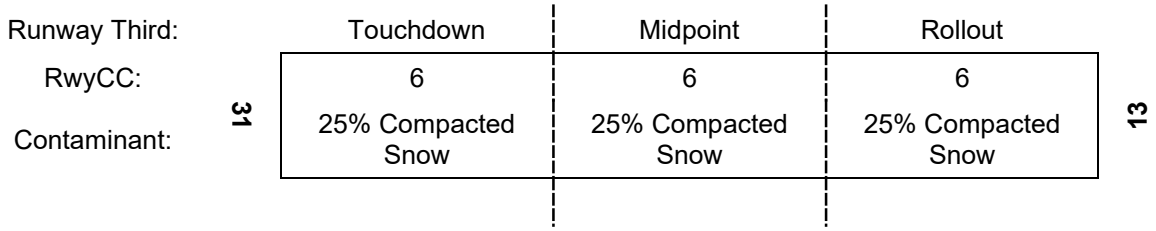
Note 1: All FICON NOTAMs have "OBSERVED (OBS) AT" and effective/expiration times but not all have "COND NOT MONITORED" (MNT).

Note 2: The percentage of coverage described in each example falls within the ranges found in paragraph 3.5.



…RWY 31 FICON 25 PCT COMPACTED SN...

Translation: Runway 31 is the landing runway and has 25% coverage of compacted snow. A RwyCC is not displayed because there is ≤25% total surface coverage by the contaminant.



…RWY 29 FICON 4/4/4 50 PCT COMPACTED SN...

Translation: Runway 29, the landing runway, has a RwyCC of "4" in all thirds and is 50% covered by compacted snow. The temperature is warmer than 5°F (-15°C). The depth of the compacted snow is not reported.

…RWY 08 FICON 5/5/5 100 PCT 1/8IN WET SN...

Translation: Runway 08 is the landing runway, has a RwyCC of "5" in all thirds, and is 100% covered with 1/8 inch (3mm) depth or less of wet snow.

…RWY 28 FICON 3/3/3 100 PCT 2IN DRY SN OVER COMPACTED SN...

Translation: Runway 28 is the landing runway, has a RwyCC of "3" in all thirds, and is completely covered by 2 inches of dry snow over compacted snow. The depth of compacted snow is not reported.

…RWY 34 FICON 5/5/5 100 PCT WET PLOWED 100FT WID REMAINDER 4IN WET SN....

Translation: Runway 34 is the landing runway, has a RwyCC of "5" in all thirds, and is 150 feet wide. The center 100 feet has been plowed leaving the plowed surface completely wet. The remaining surface outside of the plowed area is covered by 4 inches of wet snow.

…RWY 01 FICON 4/4/3 25 PCT COMPACTED SN, 25 PCT COMPACTED SN, 100 PCT 2IN DRY SN SWEPT 75FT WID REMAINDER 4IN DRY SN...

Translation: Runway 01 is the landing runway and has a RwyCC of "4" in the first two thirds and "3" in the last third. The runway is 100 feet wide, and the center 75 feet has been swept. The temperature is 5°F (-15°C) or colder. The touchdown and midpoint of the runway have 25% coverage of compacted snow. The rollout portion of the runway is completely covered by 2 inches of dry snow. The remaining area of Runway 01 is completely covered by 4 inches of dry snow.

Runway Third:		Touchdown	Midpoint	Rollout	
Remainder:		4 Inches Dry Snow			
RwyCC:	01	4	4	3	19
Contaminant:		25% Compacted Snow	25% Compacted Snow	100% 2 Inches Dry Snow	
Remainder:		4 Inches Dry Snow			

…RWY 16 FICON 4/4/4 100 PCT COMPACTED SN PLOWED 75FT WID REMAINDER 1/2IN DRY SN OVER COMPACTED SN...

Translation: Runway 16 is the landing runway, has a RwyCC of "4" in all thirds, is wider than 75 feet, and the center 75 feet has been plowed. The temperature is 5°F (-15°C) or colder. The plowed portion is 100% covered by compacted snow. The area that has not been plowed has 1/2 inch dry snow over compacted snow. The depth is not reported for compacted snow.

…RWY 16 FICON 3/3/3 100 PCT COMPACTED SN 8IN SNOWBANKS...

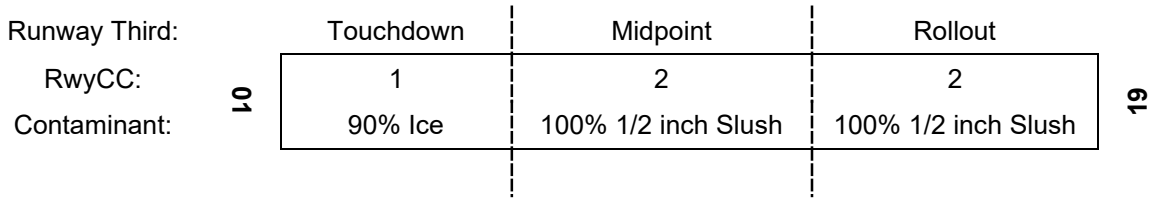
Translation: Runway 16 is the landing runway, has a RwyCC of "3" in all thirds, and has been completely plowed and swept. Therefore, the terms PLOWED or SWEPT are not used. The temperature is warmer than 5°F (-15°C). The runway is 100% covered with compacted snow and has 8 inch snowbanks.

…RWY 33 FICON 4/4/4 100 PCT COMPACTED SN PLOWED 100FT WID 24IN BERMS...

Translation: Runway 33 is the landing runway, has a RwyCC of "4" in all thirds, and has been plowed 100 feet wide leaving 100% coverage of compacted snow on the runway. The temperature is 5°F (-15°C) or colder. The depth of the compacted snow is not reported, however 24 inch berms are also observed along the edges of the plowed area.

…RWY 01 FICON 1/2/2 90 PCT ICE, 100 PCT 1/2IN SLUSH, 100 PCT 1/2IN SLUSH...

Translation: Runway 01 is the landing runway, the RwyCC is "1" in the first third, and "2" in the middle and last thirds, and the touchdown is 90% covered with ice. The midpoint and rollout are 100% covered in 1/2 inch of slush.



…RWY 10 FICON 2/2/2 100 PCT WATER...

Translation: Runway 10 is the landing runway, has a RwyCC of "2" in all thirds, and is 100% covered by water with greater than 1/8 inch (3mm) depth of water.

Note: It is important that airport operators maintain a heightened awareness of runway conditions during periods of heavy rainfall.

…RWY 36 FICON 1/1/1 100 PCT ICE SANDED...

Translation: Runway 36 is the landing runway, has a RwyCC of "1" in all thirds, is 100% covered by ice and has been treated full length and width with sand. The depth of ice is not reported.

…RWY 11 FICON 5/5/5 100 PCT 1/8IN DRY SN SANDED 80FT WID...

Translation: Runway 11 is wider than eighty feet, is the landing runway, has a RwyCC of "5" in all thirds, and is 100% covered with 1/8 inch (3mm) depth or less of dry snow and also has been treated with sand eighty feet wide.

…RWY 30 FICON 5/5/5 100 PCT WET DEICED LIQUID...

Translation: Runway 30 is the landing runway, has a RwyCC of "5" in all thirds, is 100% wet and has also been treated with a liquid deicing chemical.

Note: When reporting a runway treated by sanding or deicing, the entire published dimensions of the surface are assumed to be treated unless qualifying length/width information is also given. When reporting deicing, also report the material used as either solid or liquid, as this may have operational significance to the pilot.

3.7.5 Taxiway/Apron/Holding Bay FICON.

!LGA LGA TWY C, C1, C6, TWY D BTN RWY 13/31 AND TWY C FICON 1/2IN DRY SN OVER ICE OBS AT YYMMDD0230 YYMMDD0300-YYMMDD0430.

Translation: The specified LaGuardia taxiways have 1/2 inch of dry snow over ice.

Note: The depth of the contaminant on an apron/ramp/holding bay is not required when reporting the conditions of airports that are not certificated under Part 139 or not federally obligated.

…TWY ALL FICON DRY PLOWED 50FT WID REMAINDER 6IN DRY SN...

Translation: All taxiways are plowed 50 feet wide and are dry. The edges that have not been plowed have 6 inches of dry snow.

…TWY ALL FICON WET 18IN SNOWBANKS...

Translation: All of the taxiways are wet, with snowbanks reaching 18 inches in depth off the edge of the paved surface.

Note: When reporting snowbanks, indicate the depth and location of the snow bank. Use the terms "SNOWBANKS," "BERMS," or "WINDROWS", each defined as a ridge of snow created by mechanical means, after the surface condition. Snowbanks are assumed to be at the edge of a movement surface or, when plow/sweeper is used, at the edge of the plowed/swept area.

…TWY ALL FICON FROST...

Translation: Frost is observed completely covering all taxiways.

…TWY ALL EXC TWY G FICON 1/4IN SLUSH...

Translation: All of the taxiways except taxiway G are completely covered by 1/4 inch of slush.

Note: The depth of the contaminant is not required when reporting the conditions of airports that are not certificated under Part 139 or not federally obligated.

…APRON FEDEX FEEDER RAMP FICON 2IN DRY SN...

Translation: The FedEx Feeder ramp is covered by 2 inches of dry snow.

…APRON FEDEX FEEDER RAMP FICON ICE...

Translation: The FedEx Feeder Ramp is covered with ice. The depth of ice is not reported.

Note: The depth of the contaminant on an apron/ramp is not required when reporting the conditions of airports that are not certificated under Part 139 or not federally obligated.

3.8 **Plowed and Swept Reporting.**

3.8.1 When reporting a portion of a runway as being plowed, give the width plowed in feet and the runway's condition if not entirely cleared.

…RWY 16 FICON 3/3/3 100 PCT 1/4IN WET SN PLOWED 100FT WID 6 IN BERMS...

Translation: Runway 16 is the landing runway, has a RwyCC of "3" in all thirds, and has been plowed 100 feet wide leaving 100% coverage of 1/4 inch wet snow on the plowed portion of the runway. In addition, 6 inch berms are observed along the edges of the plowed area.

Runway Third:		Touchdown	Midpoint	Rollout	
Remainder:		6 Inch Snow Berms			
RwyCC:	**16**	3	3	3	**34**
Contaminant:		100% 1/4 Inch Wet Snow	100% 1/4 Inch Wet Snow	100% 1/4 Inch Wet Snow	
Remainder:		6 Inch Snow Berms			

3.8.2 Use the term PLOWED in a NOTAM if a portion of the surface has been plowed.

3.8.3 If the whole surface has been plowed, PLOWED is not used although reporting the surface contaminant conditions will still be appropriate.

3.8.4 Use PLOWED/SWEPT when indicating that a portion of a surface is plowed or swept and has depth, coverage, and conditions different than the surrounding area. When known, specify and list the surrounding area as "Remainder" after the plowed information.

3.8.5 Omit PLOWED /SWEPT when the entire runway, taxiway, ramp, or apron has been plowed. When just portions are PLOWED/SWEPT, report the portions that are PLOWED/SWEPT in terms of the number of feet impacted and report the remainder for the depth and contaminants type.

3.9 Miscellaneous FICON (Mud, Ash).

!LGA LGA RWY 01R FICON 50 PCT 2IN MUD, DRY, DRY. OBS AT YYMMDD0230. YYMMDD0300-YYMMDD0400.

Translation: LaGuardia airport Runway 01R is the landing runway and the touchdown portion of the runway is 50% covered with 2 inches of mud. The remaining midpoint and rollout portions of the runway are contaminant free.

Note: When mud or ash is listed as a contaminant, no RwyCC will be generated.

…RWY 01L FICON 100 PCT ASH...

Translation: Runway 01L is the landing runway and is 100% covered with ash.

3.10 Slippery When Wet Runway Procedures.

For runways where a friction survey (conducted for pavement maintenance) failed to meet the minimum friction level classification specified in AC 150/5320-12, *Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces*, the airport operator must report, via the NOTAM system, a RwyCC of "3" for the entire runway (by thirds: 3/3/3), and follow it with the term "SLIPPERY WHEN WET" when the runway is Wet. A "Wet" runway should not be reported when a "SLIPPERY WHEN WET" NOTAM is in effect. This may cause confusion by unnecessarily advertising two sets of condition codes. "Slippery When Wet" is only reported when a pavement maintenance evaluation indicates the averaged Mu value on the wet pavement surface is below the Minimum Friction Level classification specified in AC 150/5320-12. Some contributing factors that can create this condition include rubber buildup, groove failures/wear, and pavement macro/micro textures.

Note: If airport operator judgment deems a downgrade is necessary, the downgrade must be made, such that all three runway thirds match (e.g., 3/3/3, 2/2/2, and 1/1/1). An airport may discontinue the use of this NOTAM when the runway minimum friction level classification has been met or exceeded. This is the only contaminant that is reported using both runway designators.

…RWY 01/19 FICON 3/3/3 SLIPPERY WHEN WET…

Translation: The touchdown portion of Runway 01/19 is covered by rubber. Although the rubber is only observed at the approach end of Runway 01, when rubber is on a runway surface, the entire surface is reported as slippery when wet.

…RWY 01/19 FICON 2/2/2 SLIPPERY WHEN WET…

Translation: The same runway has more than 1/8 inch of water present on the surface as a result of a heavy rate of rainfall and/or standing water.

3.11 Braking Action (Taxiways, Aprons, and Holding Bays).

Airport operators may report vehicle braking action on taxiway(s), apron(s), and holding bay(s) as Good to Medium, Medium, Medium to Poor, and Poor. Braking action, when reported by the airport operator, refers to vehicle braking and can be applied as a report for surfaces other than the runway. Report the worst braking action encountered on a given taxiway, apron/ramp, or holding bay. When reporting braking actions, the type of vehicle making the report should not be provided to avoid any bias in reporting.

Note: Airport operators are advised **not** to correlate friction readings (Mu numbers) to Good, Good to Medium, Medium, Medium to Poor, Poor, or Nil runway surface conditions, since no consistent, usable correlation between Mu values and these terms has been shown to exist to the FAA's satisfaction. It is important to note that while manufacturers of the approved friction measuring equipment may provide a table that correlates braking action to Mu values, these correlations are not supported by the FAA.

3.11.1 Taxiway FICON.

!DEN DEN TWY AA FICON BA MEDIUM OBS AT YYMMDD0230. YYMMDD0253-YYMMDD0400

Translation: Denver Taxiway AA vehicle braking action is Medium with an observed at time.

…TWY B FICON BA POOR…

Translation: Taxiway Bravo FICON vehicle braking action is reported as Poor.

3.11.2 Apron FICON.

…APRON MAIN APN FICON BA POOR...

Translation: The main apron FICON has vehicle braking action of Poor.

3.12 Pilot Reported Braking Action (PIREP).

3.12.1 A PIREP can be an aircraft braking report and will typically provide other pilots with a degree/quality of observed braking. The braking action observed is dependent on the type of aircraft, aircraft weight, touchdown point, and other factors. Pilots will use the terms Good, Good to Medium, Medium, Medium to Poor, Poor, and Nil. A braking action report from a landing aircraft should be processed as a PIREP. However, when receiving a PIREP, the recipient should consider that PIREPs rarely apply to the full length of the runway and are limited to the specific sections of the runway surface in which wheel braking was applied. There is no correlation between PIREPs from different aircraft types. The airport operator may combine airport surface condition reports with PIREP information to assist in determining FICON.

3.12.2 Airport operators are encouraged to input any PIREP information received within 15 minutes of the assessment currently being reported in NOTAM Manager or E-NOTAM II. This information should be entered under the pilot reported braking action information menu. The pilot reported braking action can be selected from the dropdown menu and the type of aircraft from which the PIREP originated is typed into the text box. For example, the PIREP received by the airport operator was "Good to Medium by a Boeing-737 aircraft". This information will not be reported via the NOTAM system and is simply being recorded in the NOTAM system to provide data for analysis to determine any necessary modification to the RCAM as it relates to contaminants and airplane performance.

3.12.3 The RCAM upgrade criteria does not apply to pilot reported braking action reports of Nil.

Note: A Nil pilot reported braking action, or Nil braking action assessment by the airport operator, indicates a potentially unsafe condition. An acceptable action is for the airport operator to promptly close the particular surface prior to the next flight operation (and NOTAM that closure) until the airport is satisfied that the Nil condition no longer exists. This is a requirement at certificated and federally-obligated airports.

3.13 "Conditions (COND) Not Monitored (MNT)" NOTAMs.

3.13.1 Airport operators should use "conditions not monitored" NOTAMs as a way to provide information to pilots related to the conditions not being monitored at the airport, perhaps due to operations hours or staffing. COND NOT MNT is appended to the last FICON NOTAM an airport would issue prior to ending snow and ice control operations.

3.13.2 Airport operators should avoid using "airport unattended" NOTAMs as a substitute for "conditions not monitored" because this type of NOTAM sends the incorrect message that other services provided by the airport, e.g., ATC, ARFF, fuel, are not available or accessible when the conditions are not being monitored.

3.13.3 The "Conditions not monitored" NOTAM is the preferred airport condition reporting for airport operators to use to address movement areas or airfield surfaces. When the field conditions will not be monitored, follow the most recent observation with the words "COND NOT MNT" (date/time) (date/time)." The time parameters specified must fall within the effective expiration times. FICON NOTAMs are considered temporary, therefore the expiration time for FICON NOTAMs must not exceed 24 hours from the effective time, except when the reported contaminant is Ash, Mud, Oil, Rubber, or Sand.

3.13.4 Airport operators should issue the "conditions not monitored" NOTAM accompanied with the most recent observation.

Example: !LGA LGA RWY 13 FICON 1/1/1 100 PCT ICE OBS AT YYMMDD0230. COND NOT MNT YYMMDD0300-YYMMDD1045.

Translation: LaGuardia Runway 13 is the landing runway and is 100% covered by ice. The RwyCC is 1/1/1. The field conditions are not monitored during a specified timeframe.

3.13.5 The airport operator can submit for publication a note stating conditions are not monitored between the hours of "X" and "Y" in the Chart Supplement or their Airport Master Records and Reports (5010).

3.14 "Surface (SFC) Conditions (COND) Not Reported (REP)" NOTAMs.

When it is determined that no surface condition reports will be taken for longer than a 24-hour period, issue a single NOTAM for the entire time-period. Use the phrase "SFC COND NOT REP", as this differs from Conditions Not Monitored. The difference between SFC Conditions Not Reported and Conditions Not Monitored is that SFC Conditions Not Reported is an aerodrome (AD) NOTAM and is for an extended period of time. Conditions Not Monitored is a FICON NOTAM that is accompanied with the most recent observation. This is used to report brief periods of time when conditions will not be monitored. If the airport has published a set schedule when conditions are not monitored in the Airport Master Record, a "SFC Conditions Not Monitored" NOTAM is not necessary to reflect these same hours.

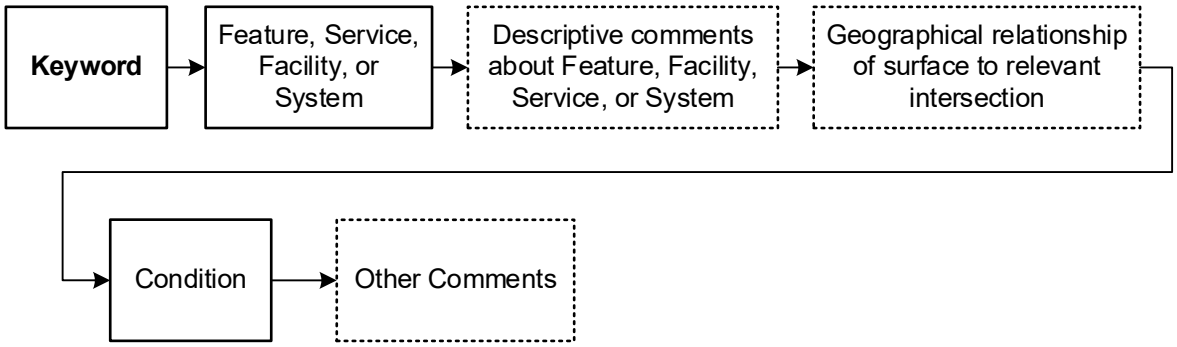
Example: !CWA CWA AD AP SFC COND NOT REP YYMMDD2200-YYMMDD0500

Translation: Central Wisconsin airport surface conditions are not being reported during a specified timeframe.

3.15 Runway Light Obscuration or Outages.

The diagram below illustrates the elements for a NOTAM to address runway light obscuration or outages. The paragraphs below provide some examples and plain text translations. Not all NOTAMs will contain all of the NOTAM elements.

Figure 3-1. NOTAM Elements to Address Runway Light Obscuration or Outages



3.15.1 Runway Light Obscuration.

When reporting runway light obscuration due to snow and ice, report just the lights that are completely obscured.

1. Do not report lights that are partially obscured.
2. Be specific about which lights are affected, such as Runway 09/27 W 2000 feet.
3. Do not report the reason for the obscuration.

!BTV BTV RWY 15/33 REDL OBSC YYMMDD1300-YYMMDD1400

Translation: Burlington airport Runway 15/33 has edge lights obscured with a self-cancelling expiration time.

3.15.2 Runway and Affiliated Light Outages.

3.15.2.1 **Runway Centerline Lights (RCLL).**

!ATL ATL RWY 08R/26L RCLL U/S YYMMDD2300-YYMMDD1200

Translation: Atlanta airport Runway 08R/26L center line lights are out of service with a self-cancelling expiration time.

3.15.2.2 **Touchdown Zone Lights (RTZL).**

!ATL ATL RWY 08R RTZL U/S YYMMDD2300-YYMMDD1200

Translation: Atlanta Runway 08R touchdown zone lights are out of service with a self-cancelling expiration time.

3.15.2.3 **Runway Edge Lights (REDL).**

!ATL ATL RWY 08R/26L REDL U/S YYMMDD2300-YYMMDD0400

Translation: Atlanta airport Runway 08R/26L edge lights are out of service with a self-cancelling expiration time.

Note: When commissioning runway edge light systems, indicate the exact type of system; for example, Low Intensity Runway Lights (LIRL), Medium Intensity Runway Lights (MIRL), High Intensity Runway Lights (HIRL), etc. Once commissioned and published, runway edge lights are then shown as EDGE LGT.

3.15.2.4 **Runway Lead-In Lighting System (RLLS) formerly LDIN.**

!DCA DCA RWY 19 RLLS U/S YYMMDD2300-YYMMDD1200

Translation: Washington Reagan airport Runway 19 runway lead-in lighting system is out of service with a self-cancelling expiration time.

3.15.2.5 **Runway End Light (RENL) co-located with Threshold Lights**

!IAD IAD RWY 01R RENL U/S YYMMDD2000-YYMMDD2130

Translation: Washington Dulles airport Runway 01R runway end light is out of service with a self-cancelling expiration time.

3.15.2.6 **Aerodrome Total Power Failure.**

!SPA SPA AD AP LGT U/S YYMMDD2300-YYMMDD1200

Translation: Spartanburg airport all aerodrome lights are out of service with a self-cancelling expiration time.

Note: See the use of the keyword "AD" for any total aerodrome light outage situation.

3.15.2.7 **Pilot Controlled Lighting (PCL).**

These examples discuss controlling runway or approach lights.

!SBY SBY SVC PCL ALL U/S YYMMDD2300-YYMMDD1200

Translation: Salisbury airport pilot control lights are out of service with a self-cancelling expiration time.

…SVC PCL FREQ CHANGED TO 122.8 YYMMDD2300-PERM

Translation: Pilot control lights frequency has changed to 122.8 with an effective date that makes it a permanent change.

…SVC PCL RWY 18 VASI U/S YYMMDD2300-YYMMDD1200

Translation: Runway 18 pilot control Visual Approach Slope Indicator (VASI) is out of service with a self-cancelling expiration time.

3.16 **Other Reportable Conditions.**

3.16.1 The airport operator ensures that a NOTAM is submitted for conditions considered hazardous or potentially hazardous to the aircraft operator. Permanent changes in surface conditions should be coordinated for publication.

3.16.2 Some examples of other reportable conditions are as follows:

!TSG TSG RWY 12/30 NUMEROUS 3IN CRACKS YYMMDD0100-YYMMDD1700

Translation: Tanacross airport Runway 12/30 has numerous 3 inch cracks with a reported discovery date and a self-cancelling expiration time.

… AIRSPACE CONTROLLED BURN WI AN AREA DEFINED AS .5NM RADIUS OF FXE360001 SFC-1500FT YYMMDD2300-YYMMDD0100

Translation: Airport is executing a controlled burn on the airport causing dense smoke for a given time period.

Note: Some airport operators may not be authorized to submit airspace NOTAMs for controlled burns. Direct contact with FSS may be required to issue this type of NOTAM.

3.16.2.1 **Signage.**

!IAD IAD TWY U7 HLDG PSN SIGN FOR RWY 01L/19R NOT STD YYMMDD2300-YYMMDD1200

Translation: Dulles airport holding position sign on taxiway U7 for runway 01L/19R is not lighted for a date and period indicated and with a self-cancelling expiration time.

…SFC PAINTED HLDG PSN SIGN NOT STD YYMMDD1200-YYMMDD2300

Translation: Surface painted holding position signs are not standard for a specific date with a self-cancelling expiration time.

3.16.2.2 **Taxiway Lights.**

!SHL SHL TWY K, L EDGE LGT U/S YYMMDD2300-YYMMDD1200

Translation: Sheldon airport taxiway(s) K & L edge lights are out of service beginning at a certain period with a self-cancelling expiration time.

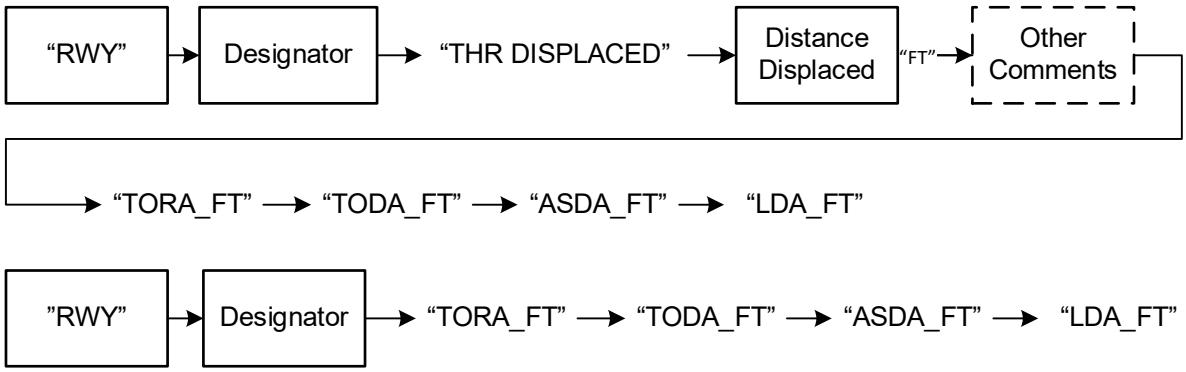
…TWY C STOP BAR LGT FOR RWY 16R/34L U/S YYMMDD2300-YYMMDD1200

Translation: Taxiway C stop bar lights for Runway 16R/34L are out of service for a date and period indicated with a self-cancelling expiration time.

3.17 Runway Thresholds and Declared Distances.

The diagram below illustrates the elements for a NOTAM to address runway thresholds and declared distances. The paragraphs below provide some examples and plain text translations illustrating the structure of these NOTAMs. Not all NOTAMs will contain all of the elements.

Figure 3-2. NOTAM Elements to Address Runway Thresholds and Declared Distances



3.17.1 A displaced threshold affects runway length available for aircraft landing over the displacement. Report threshold displacement as closure of a portion of the runway until the actual physical appearance is altered so the closed runway segment no longer looks like a landing area. Consult with the responsible FAA Flight Procedures office when displacing a threshold because the resulting displacement may result in IFPs to the runway being impacted.

3.17.2 When a runway condition restricts or precludes the use of any portion of a runway resulting in a change to the declared distances, include the published take-off run available (TORA), take-off distance available (TODA), accelerated stop distance available (ASDA), and landing distance available (LDA) in the NOTAM. Ensure that a

second NOTAM is originated for the reciprocal runway with all declared distances if any value has changed. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published. See AC 150/5300-13, *Airport Design,* for guidance on the use of declared distances.

3.17.3 Permanent changes to the TORA, TODA, ASDA, and LDA should be issued as a PERM NOTAM and should not last for more than 90 days. When the change will be permanent, submit the new information to the appropriate Regional Offices (Safety and Standards Branch) through the ADIP. Maintain the PERM NOTAM until the new information is processed and published in the appropriate FAA publication or Chart Supplement. Once published, cancel the PERM NOTAM.

Note: Any temporary change to declared distance information should not be issued as a PERM NOTAM.

!MKC MKC RWY 19 THR DISPLACED 300FT MARKING NOT STD. DECLARED DIST: TORA 6827FT TODA 6827FT ASDA 6827FT LDA 6527FT. YYMMDD1500–YYMMDD1600

!MKC MKC RWY 01 DECLARED DIST: TORA 6827FT TODA 6827FT ASDA 6527FT LDA 6527FT YYMMDD1500 -YYMMDD1600

Translation: Kansas City airport Runway 19 threshold is displaced 300 feet, therefore the Runway 19 landing LDA is reduced by 300 feet. The LDA and ASDA for Runway 01 are also reduced by 300 feet. An established self-cancelling expiration time has been established.

… RWY 28R THR DISPLACED 1500FT. DECLARED DIST: TORA 13001FT TODA 13001FT ASDA 13001FT LDA 11501FT. YYMMDD0300–YYMMDD0600

… RWY 10L DECLARED DIST: TORA 13001FT TODA 13001FT ASDA 11501FT LDA 11501FT YYMMDD0300–YYMMDD0600

Translation: A temporary structure becomes a controlling obstacle to the approach of Runway 28R and departure of Runway 10L resulting in the Runway 28 threshold being displaced 1500 feet resulting in changes to declared distances for Runways 10L and 28R. An established self-cancelling expiration time has been established for each runway.

… RWY 05/23 NE 500FT CLSD. DECLARED DIST: RWY 05 TORA 7002FT TODA 7002FT ASDA 7002 FT LDA 7002 FT RWY 23 TORA 7002FT TODA 7002FT ASDA 7002 FT LDA 7002FT YYMMDD0300–YYMMDD2100

Translation: Construction on Runway 05 requires 500 feet to be closed to protect a construction area thus changing declared distances to Runways 05 and 23. An established self-cancelling expiration time has been established.

… RWY 09/27 W 500FT CLSD FOR TKOF. DECLARED DIST: RWY 09 TORA 8446FT TODA 8446FT ASDA 8446FT LDA 8446FT. RWY 27 TORA 8946FT TODA 8946FT ASDA 8246FT LDA 8246FT. YYMMDD0300–YYMMDD2100

Translation: The west 500 feet of Runway 09 is closed. Aircraft will enter the runway and depart Runway 09 from an intersecting taxiway. Because the NOTAM uses both runways as the runway designator, if any declared distance has changed, all declared distances for both runways are to be included in the NOTAM. An established self-cancelling expiration time has been established.

3.17.4 In the event the published TORA, TODA, ASDA, and LDA need to be reported without referencing the runway condition that caused the change, report declared distances or changes to published declared distances. For example, when the published runway length is changed, report the declared distances or correct any erroneous declared distances currently published.

!CLT CLT RWY 05/23 DECLARED DISTANCES: RWY 05 TORA 7502FT TODA 7502FT ASDA 7202FT LDA 7202FT. RWY 23 TORA 7502FT TODA 7502FT ASDA 7202FT LDA 7202FT. YYMMDD0300–PERM

Translation: Charlotte airport Runway 05 and Runway 23 have permanent changes to their runway distances.

… RWY 08/26 DECLARED DISTANCES: RWY 08 TORA 10000FT TODA 10500FT ASDA 10000FT LDA 10000FT. RWY 26 TORA 10000FT TODA 10000FT ASDA 10400FT LDA 11000FT. YYMMDD0300–PERM

Translation: A temporary or permanent situation at an airport with nonstandard Runway Safety Areas (RSAs) or Object Free Area (OFA) leads to defining declared distances.

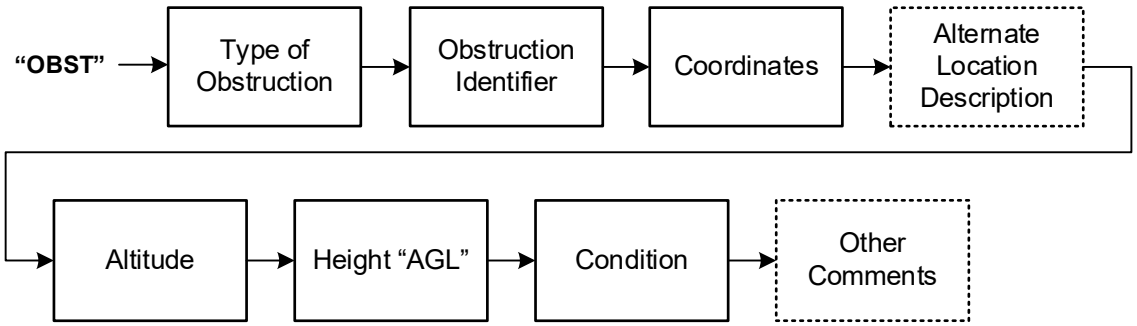
… RWY 08/26 NOW 10000FT X 150FT DECLARED DIST: RWY 08 TORA 9000FT TODA 9500FT ASDA 9000FT LDA 9000FT. RWY 26 TORA 9000FT TODA 9000FT ASDA 9400FT LDA 10000FT. YYMMDD0300–PERM

Translation: A NOTAM is required to correct an error in the Chart Supplement until the next publication date.

3.18 **On or Off Airport Obstructions and Obstruction Lights.**

The diagram below illustrates the elements for an obstruction NOTAM. The elements "OBST; Type of Obstruction; Antenna Structure Registration (ASR) Number/Aeronautical Study Number (ASN); Coordinates; and HEIGHT (MSL) are mandatory elements; all other elements are included as needed. The paragraphs below provide some examples and plain text translations illustrating the structure of certain NOTAMs. Not all NOTAMs will contain all of the elements.

Figure 3-3. NOTAM Elements for an Obstruction



3.18.1 Obstructions such as towers, cranes, stacks, wind turbines, non-FCC towers, and power lines should have ASN numbers. Any failure or malfunction which affects a top light or flashing obstruction light regardless of its position is a condition for a NOTAM.

3.18.2 Specify the altitude MSL with the unit of measurement (FT), if known. Otherwise, state UNKNOWN. In parentheses, specify the height with the unit of measurement (FT) and reference datum (AGL). Height is identified as MSL (when known) and may be accompanied with an AGL height listed in parenthesis.

3.18.3 Cranes that are marked by a flag or when the boom is lowered during night hours, periods of low visibility, do not exceed any obstruction standards contained in Part 77, and removed beyond the runway or taxiway safety areas may not require a NOTAM. At Part 139 airports, cranes not in use and located beyond the Runway OFA should not be NOTAMed; provided they meet all the same criteria as cited above. Comply with the Airspace Determination requirements for NOTAMS for on-airport cranes and construction activity.

3.18.4 Report the height of obstruction lights on terrain (hills) in MSL only, as the terrain is the obstacle, not the light on the terrain.

3.18.5 When reporting an obstruction or obstruction light(s) failure located within the airport boundaries, identify the outage per the following:

1. Height, MSL, and AGL if known.
2. Distance from the ARP (nautical miles (NM)).
3. Direction from the Airport Reference Point (ARP) (16-point compass: N; NNE; NE; ENE; E; ESE; SE; SSE; S; SSW; SW; WSW; W; WNW; NW; NNW).
4. Tower registration number or ASR number (if applicable). The tower registration number can be found at wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp.

3.18.6 A NOTAM should be issued for all obstruction light outages within a 5 statute miles (SM) (4.3 nautical miles) radius of an airport, or obstruction light outages outside a 5SM radius that exceed 200 feet AGL. When able, report outages to the limits of the Part 77 surfaces of the airport.

!GSP GSP OBST TOWER LGT (ASR 1234567) 345313.12N0815744.34W (3NM SSW SPA) 1528FT (564FT AGL) U/S YYMMDD1200-YYMMDD1200

Translation: Greer airport is reporting a tower obstruction light at a specific lat/long and 3NM SSW of Spartanburg is out of service with a specific date and time for return to service.

… OBST TOWER LGT (ASR 1234567) 420651.07N0817546.27W (12NM N PWK) 1049FT (330FT AGL) U/S YYMMDD1600-YYMMDD1600

Translation: Airport reports an obstruction tower light at a specific lat/long and within 12NM of north of Chicago Executive with identified above ground level height is out of service for an established date and time.

3.18.7 When the obstacle is within 500 feet either side of the centerline of a charted helicopter route, describe the plain language location by using the bearing, distance, and aerodrome designator of the nearest public-use airport. When able, report outages to the limits of the Part 77 surfaces of the airport. An Aeronautical Study Number (ASN), if known, should be included in parentheses in the NOTAM. If the ASN is not known, use parentheses to indicate (ASN UNKNOWN) in the NOTAM. See examples below:

!RDU RDU OBST CRANE (ASN 1234567) 345140N0804506W (1.44NM SW RDU) 580FT (195FT AGL) NOT LGTD YYMMDD2300-YYMMDD2300

Translation: Raleigh/Durham airport reports a crane at identified lat/long with cardinal direction from the lat/long that delineates the height and the crane being unlighted for a given time period.

… OBST WIND TURBINE (ASN UNKNOWN) 452315N0701346W (18.4NM SW BGR) 2820FT (410FT AGL) NOT LGTD YYMMDD2330-YYMMDD2359

Translation: Airport reports a wind turbine within an identified lat/long with a given height above ground level and not lighted for a set time period. A self-cancelling expiration time has been established.

3.18.8 The ASR number should be obtained from the tower owner when the outage is called in and will be put in the text of the NOTAM. The ASR number may also be obtained from the FCC website at wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp.

Note: See AC 70/7460-1, *Obstruction Lighting and Marking,* for additional guidance about obstruction light failure notification requirements.

3.18.9 Persons or organizations with obstruction ownership responsibilities should report the improper functioning of any obstruction light or lights immediately by telephone to the nearest local FSS. Callers should be prepared to provide the tower registration number (ASR number) and the name of the nearest airport. Reporting the operating status of

obstruction lights on communication towers is the responsibility of the communication tower operator (47 CFR § 17.48).

3.18.9.1 If there is a report of an obstruction light outage on a tower outside the airport, airport operators with the responsibility of initiating NOTAMs should:

1. First check for any existing Flight Safety NOTAMs via the FSS or at http://notams.aim.faa.gov/notamSearch/.
2. If NOTAMs are not found, contact and advise the tower operator about the outage.
3. If the tower operator is not known, look up the information on the Federal Communications Commission (FCC) website at wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp.

3.19 Birds and Other Wildlife.

Birds and other wildlife activity NOTAMs should focus on chronic or persistent problems that are relatively short-lived or seasonal in nature. NOTAMs of this type are effective at providing timely alerts when migration (e.g., birds, caribou), and other seasonal nesting, breeding, or movement activity is contrary to or beyond the scope of published airport data in the Chart Supplement or 5010 Airport Master Records.

3.19.1 Information that should be published in the Chart Supplement or 5010 Airport Master Record includes locations and conditions for seasonal movements or migrations associated with specific geographic locations, altitudes, or predictable behaviors. For example, waterfowl, raptors, gulls, or caribou that migrate on or near an airport during a short period each spring and fall in a predictable pattern. Movement activity of some hazardous species significantly increases during the breeding season (e.g., deer in the fall and alligators in spring to early summer) which may escalate wildlife/aircraft strike risk on airports during those seasons. Similarly, nest locations of hazardous species (e.g., bald and golden eagles, heron rookeries) located on or near an airport should be identified in the publications cited above.

3.19.2 When the airport operator observes any unusual or abnormal activity different from what is already published in Chart Supplement or 5010 Airport Master Record, a NOTAM can be issued citing the change in wildlife activities or conditions. Additionally, NOTAMs can be issued to provide information concerning the presence of threatened or endangered species.

3.19.3 NOTAM language should be as specific as possible to describe the activity that is occurring. NOTAM information should be updated and or cancelled as soon as possible once the condition dissipates and should not duplicate any published information or be published for the duration of seasonal events. Some example NOTAMs language are as follows:

….AD AP INCREASED BIRD ACT NW SIDE YYMMDD1000 – YYMMDD1700

Translation: Bird activity has increased on the northwest side of the airport according to a self-cancelling expiration time.

….AD AP BIRD MIGRATION INPR YYMMDD0800 – YYMMDD2000DLY

Translation: Bird migration in progress daily according to specific times.

….AD AP WILDLIFE ACT INCREASED NORTH SIDE YYMMDD1200 – YYMMDD2359DLY

Translation: Wildlife activity increased daily on the north side of the airport according to specific times.

3.19.4 Issue a PERM NOTAM for bird/wildlife activities or conditions only when it is a new condition being established as a permanent activity for the airport. Wildlife NOTAMs are not issued as PERM, unless the publication process has been initiated. See paragraph 2.3.13 for the PERM NOTAM process.

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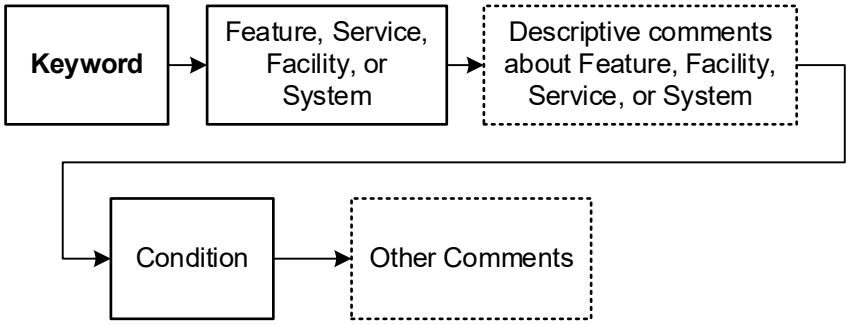
Chapter 4. Select NOTAM Requirements Criteria

4.1 Work In Progress (WIP).

Use the WIP criteria for routine maintenance events such as mowing, snow removal operations, and various types of short-term infrastructure maintenance and repairs. A particular surface should be closed as defined in each airport's *Airport Certification Manual* for work that goes beyond routine maintenance. The diagram below illustrates the elements for a WIP NOTAM. The paragraphs below include some examples and plain text translations that illustrate certain WIP NOTAMs. Not all NOTAMs will contain all of the elements. Note that WIP is only used when the work is occurring.

Figure 4-1. Work-in-Progress NOTAM Elements



4.1.1 Content of NOTAMs for WIP.

4.1.1.1 Any NOTAM associated with WIP on or adjacent to a runway, taxiway, or apron are to begin with one of the following keywords: RWY, TWY, APRON, or AD. Additionally, if the work is proceeding in a particular direction, that should be specified.

4.1.1.2 The NOTAM text would include the surface name/designator, the specified name/designator of the surface on which the work is being conducted, and the surface segment description specified in feet or from a specific point to point.

4.1.2 Snow/Ice Removal.

Any NOTAM associated with snow/ice removal operations on multiple runways are to be described as "WIP (reason);" for example, SNOW (SN) REMOVAL, ICE REMOVAL. (See paragraph 4.1.) Airport operators are to ensure this NOTAM remains active when actual snow and ice removal operations are taking place. An individual NOTAM for each runway impacted is issued as the WIP moves from one runway to the next. In order to ensure the safety and efficiency of this snow removal operation, all of the following conditions should be met before proceeding:

4.1.2.1 The ATCT is in operation during the valid period of each NOTAM. For non-towered airports, communication via a secondary control center or use

of Common Traffic Advisory Frequency or other local communication means may be used during the valid period of each NOTAM.

4.1.2.2 Closure times for each runway have been agreed upon by the airport operator, overlying air traffic facility/ATCT or other local airport control centers during the valid period of each NOTAM.

4.1.2.3 Operations are based on the process described in the Airport Certification Manual, Snow and Ice Control Plan, or other agreement between the airport operator, FSS, overlying air traffic facility, ATCT, or other local airport control centers as applicable. Some examples of WIP NOTAMs are as follows:

…AD AP ALL SFC WIP SN REMOVAL YYMMDD0700-YYMMDD1500

Translation: All aerodrome surfaces have snow removal work in progress for time given.

Note: A NOTAM associated with snow/ice removal can be described as "Work in Progress (reason)," (for example, Snow Removal, Ice Removal). Airport operators must ensure this NOTAM remains active when actual snow and ice removal operations are taking place.

…RWY 01L/19R WIP RESURFACING YYMMDD0700-YYMMDD1500

Translation: Runway 01L/19R has resurfacing work in progress for the time given.

…TWY A WIP ELECTRICAL LINE TRENCHING YYMMDD0800-YYMMDD1400

Translation: Taxiway Alpha has electrical lines trenching work in progress for the time given.

!IAD IAD RWY 01L/19R NE 500FT WIP MOWING ADJ YYMMDD0700-YYMMDD0150

Translation: Dulles airport Runway 01L/19R has mowing adjacent to the northeast 500 feet of the runway underway for the specific time provided.

…TWY E BTN RWY 05/23 AND TWY A WIP TRENCHING SOUTH SIDE YYMMDD0700-YYMMDD1500

Translation: Airport has work in progress trenching on taxiways near Runway 05/23 for an identified time period.

…TWY D4, D5, D6, TWY B BTN RWY 13/31 AND TWY D, TWY D WEST OF RWY 05/23 WIP SN REMOVAL YYMMDD0700-YYMMDD1500

Translation: Airport has work in progress snow removal involving the specified taxiways in proximity to Runway 13/31 and Runway 05/23 for an identified time period.

…APRON FEDEX APN W HALF WIP RESURFACING YYMMDD0700-YYMMDD1500

Translation: Airport apron has apron work in progress resurfacing on the west half for an identified time period.

…RWY 01L/19R WIP MAINT VEHICLES ADJ E SIDE OF RWY YYMMDD0700-YYMMDD1500

Translation: Airport has work in progress on runway 01L/19R involving maintenance vehicles on the east side for an identified time period.

…RWY 01L/19R WIP SN REMOVAL YYMMDD0700-YYMMDD1500

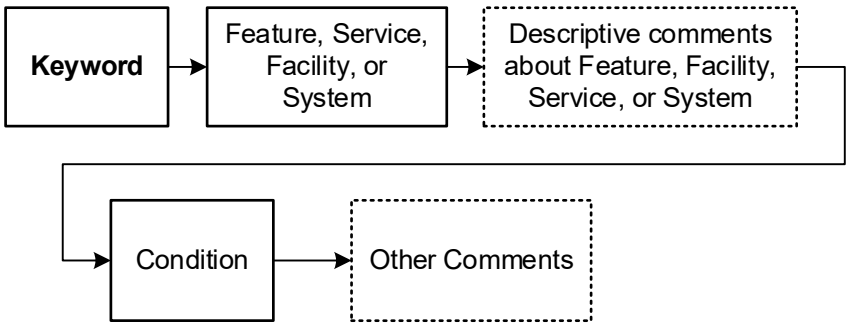
Translation: Runway 01L/19R has work in progress involving snow removal for an identified start and completion time.

4.2 **Certificated Airport Aircraft Rescue and Fire Fighting (ARFF).**

4.2.1 Part 139.339(c)(8) requires NOTAM (D) for airports (not runways) when ARFF equipment is inoperative or unavailable and replacement equipment is not available. Except as indicated in Part 139.319(c), the airport operator has 48 hours to replace or substitute equipment before the index changes. Air carriers and others are to be notified that ARFF equipment is out of service. The airport operator should provide an ending time for each NOTAM. If the airport operator does not provide an ending time, FSS will add 48 hours to the time of receipt and publish the appropriate NOTAM.

4.2.2 The diagram below illustrates the elements for an ARFF-related NOTAM. The paragraphs below provide some examples and plain text translations illustrating the structure of certain ARFF NOTAMs. Not all NOTAMs will contain all of the elements.

Figure 4-2. ARFF-related NOTAM Elements



4.2.3 ARFF Index.

4.2.3.1 The ARFF Index for each certificated airport is published in the Chart Supplement. In the Chart Supplement legend is a list that indicates Index and corresponding ARFF equipment requirements. At certificated airports listed in the Chart Supplement, the certificate holder (airport operator) is required to notify air carriers by NOTAM when required ARFF equipment is inoperative or unavailable and replacement equipment is not readily available. See 14 CFR 139.319(d)(3). If the required Index level of capability is not restored within 48 hours, the airport operator is required to limit air carrier operations to those compatible with the Index corresponding to the remaining operative rescue and firefighting equipment. See 14 CFR 139.319(g)(3).

4.2.3.2 Permanent changes to the ARFF Index occurring during publication cycles are issued as FDC NOTAMs.

4.2.3.3 If the ARFF vehicle is still out of service after 48 hours, the airport operator is to submit a NOTAM or notify the FSS of a temporary index change and approximate duration time.

!FTW FTW AD AP ARFF NOW INDEX A YYMMDD2300-YYMMDD2300

Translation: At Fort Worth Meacham International airport the ARFF Index is now A, with an established self-cancelling expiration time.

… AD AP ARFF NOT AVBL YYMMDD1200-YYMMDD1200

Translation: Airport ARFF is not available for an identified self-cancelling expiration time.

4.3 **Engineered Materials Arresting Systems (EMAS).**

The airport operator ensures that a NOTAM is submitted for conditions considered to be hazardous or potentially hazardous to the aircraft operator, such as reporting damage or inoperability of the EMAS installed at the airports. See 14 CFR § 139.339(c)(9). An

EMAS NOTAM should be issued when these conditions exist. The paragraphs below provide some examples and plain text translations illustrating the structure of certain EMAS NOTAMs. Not all NOTAMs will contain all of the elements.

!MDW MDW RWY 31C ENGINEERED MATERIALS ARST SYSTEM NOT STD YYMMDD1320-YYMMDD2200

Translation: Midway airport Runway 31C EMAS system is currently installed but is not standard for a particular time period.

… RWY 31C ENGINEERED MATERIALS ARST SYSTEM U/S YYMMDD1335-YYMMDD1200

Translation: Runway 31C EMAS system is out of service for a standard time period.

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Appendix A. SAMPLE NOTAM LOG

NOTAM ISSUED

NOTAM#_____ FSS NOTAM# _____

DATE ISSUED_____ TIME ISSUED _____ UTC

ISSUED BY: _____

NOTAM TEXT:

_____

_____

_____

AGENCIES NOTIFIED

ATC Facility _____AIR CARRIER(S) _____FSS _____

FBOs _____ TENANT(S) _____

DoD_____

NOTAM CANCELLED

DATE _____ TIME: _____ UTC

CANCELLED BY: _____

AGENCIES NOTIFIED

ATC Facility _____AIR CARRIER(S) _____FSS _____

FBOs _____ TENANT(S) _____ DoD _____

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Appendix B. RUNWAY CONDITION ASSESSMENT MATRIX (RCAM)*

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	**Code**	**Mu (μ) [1]**	**Vehicle Deceleration or Directional Control Observation**	**Pilot Reported Braking Action**
• Dry	**6**	**40 or Higher**	---	---
• Frost • Wet (Includes Damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	**5**		Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
5º F (-15ºC) and Colder outside air temperature: • Compacted Snow	**4**	**39 to 30**	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (Any depth) over Compacted Snow ***Greater than 1/8 inch (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5º F (-15ºC) outside air temperature:*** • Compacted Snow	**3**		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 (3mm) inch depth of: • Water • Slush	**2**	**29 to 21**	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	**1**		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice [2] • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	**0**	**20 or Lower**	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

[1] The correlation of the Mu (μ) values with runway conditions and condition codes in the Matrix are only approximate ranges for a generic friction measuring device ***and are intended to be used only to downgrade a runway condition code; with the exception of circumstances identified in Note 2.*** *Airport operators should use their best judgment when using friction measuring devices for downgrade assessments, including their experience with the specific measuring devices used.*

[2] In some circumstances, these runway surface conditions may not be as slippery as the runway condition code assigned by the Matrix. The airport operator may issue a higher runway condition code (but no higher than code ***3****) for each third of the runway if the Mu value for that third of the runway is 40 or greater obtained by a properly operated and calibrated friction measuring device,* ***and all other observations, judgment, and vehicle braking action support the higher runway condition code. The decision to issue a higher runway condition code than would be called for by the Matrix cannot be based on Mu values alone; all available means of assessing runway slipperiness must be used and must support the higher runway condition code.*** *This ability to raise the reported runway condition code to a code 1, 2, or 3 can only be applied to those runway conditions listed under codes 0 and 1 in the Matrix.*

The airport operator must also continually monitor the runway surface as long as the higher code is in effect to ensure that the runway surface condition does not deteriorate below the assigned code. The extent of monitoring must consider all variables that may affect the runway surface condition, including any precipitation conditions, changing temperatures, effects of wind, frequency of runway use, and type of aircraft using the runway. If sand or other approved runway treatments are used to satisfy the requirements for issuing this higher runway condition code, the continued monitoring program must confirm continued effectiveness of the treatment.

Caution: Temperatures near and above freezing (e.g., at 27°F (-3°C) and warmer) may cause contaminants to behave more slippery than indicated by the runway condition code given in the Matrix. At these temperatures, airport operators should exercise a heightened level of runway assessment and should downgrade the runway condition code, if appropriate.

** Source: AC 150/5200-30, current version, is the source of the RCAM. Any updates to the RCAM in that AC supersede this appendix.*

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Appendix C. FRICTION MEASURING EQUIPMENT ABBREVIATIONS AND NAMES

ABBREVIATION

BOW	Bowmonk Decelerometer (Bowmonk Sales)
BRD	Brakementer−Dynometer
ERD	Electronic Recording Decelerometer (Bowmonk)
GRT	Griptester (Findlay, Irvine, LTD)
MUM	Mark 6 Mu Meter (Douglas Equipment LTD)
NAC	Neubert Aero Corp
RFT	Runway friction tester (Dynatest)
RT3	Haliday Technologies
SFH	Surface friction tester (high pressure tire) (SAAB, Airport Surface Friction Tester AB)
SFL	Surface friction tester (low pressure tire) (SAAB, Airport Surface Friction Tester AB)
SKH	Skiddometer (high pressure tire) (AEC, Airport Equipment Co.)
SKL	Skiddometer (low pressure tire) (AEC, Airport Equipment Co.)
TAP	Tapley Decelerometer (Tapley Sales)
VER	Vericom (VC3000)

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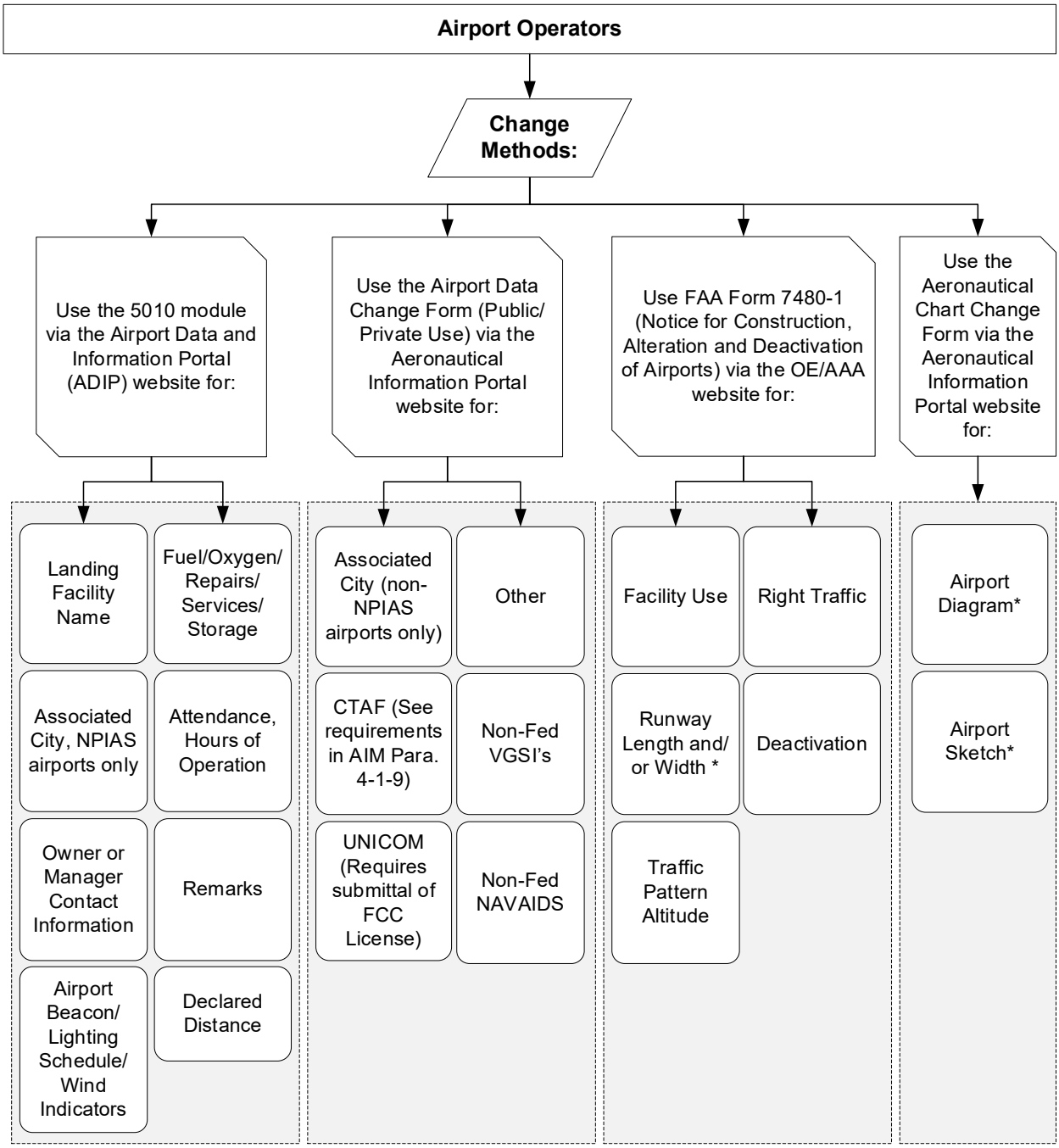
Appendix D. PERM NOTAM PUBLICATION PROCESS FLOWCHART



Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Safety and Operations Division, Federal Aviation Administration ATTN: AAS-300, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subject: AC 150/5200-28G Date: _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

_____
_____
_____

Submitted by: _____ Date: _____

Appendix D
Safety and Phasing Plan Checklist

APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not a required submittal.

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	2.5	✓			Starting pg. 6 of PDF, Sec. 2
Operational safety is a standing agenda item for construction progress meetings.	2.5	✓			Pg. 6 of PDF, Sec. 2
Scheduling of the construction phases is properly addressed.	2.6	✓			Start Pg. 7 of PDF, Sec. 3
Any formal agreements are established.	2.5.3			✓	
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	2.7.1	✓			CSPP in App A
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	2.7.1.1	✓			CSPP in App A
Access routes used by ARFF vehicles affected by the project are addressed.	2.7.1.2			✓	
Access routes used by airport and airline support vehicles affected by the project are addressed.	2.7.1.3			✓	
Underground utilities, including water supplies for firefighting and drainage.	2.7.1.4			✓	

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	2.7.1.5			✓	
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	2.7.1	✓			CSPP in App A
Temporary changes to taxi operations are addressed.	2.7.2.1	✓			Pg. 8 of PDF. Sec. 3
Detours for ARFF and other airport vehicles are identified.	2.7.2.2			✓	
Maintenance of essential utilities and underground infrastructure is addressed.	2.7.2.3			✓	
Temporary changes to air traffic control procedures are addressed.	2.7.2.4			✓	
NAVAIDs					
Critical areas for NAVAIDs are depicted on drawings.	2.8			✓	
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	2.8	✓			Pg. 9 of PDF. Sec. 4
Protection of NAVAID facilities is addressed.	2.8	✓			Pg. 9 of PDF. Sec. 4
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	2.8			✓	
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	2.8, 2.13.1, 2.13.5.3.1, 2.18.1			✓	Procedure for Contractor to contact Airport FBO; EYF is non-towered
Contractor Access					
The CSPP addresses areas to which contractor will have access and how	2.9	✓			CSPP in App A

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
the areas will be accessed.					
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	2.9			✓	
The location of stockpiled construction materials is depicted on drawings.	2.9.1	✓			CSPP in App A
The requirement for stockpiles in the ROFA to be approved by FAA is included.	2.9.1	✓			Pg. 9 of PDF, Sec. 5
Requirements for proper stockpiling of materials are included.	2.9.1	✓			
Construction site parking is addressed.	2.9.2.1	✓			Pg. 9 of PDF, Sec. 5
Construction equipment parking is addressed.	2.9.2.2	✓			Pg. 9 of PDF Sec. 5
Access and haul roads are addressed.	2.9.2.3	✓			Pg. 10 of PDF, Sec. 5
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, *Painting, Marking and Lighting of Vehicles Used on an Airport,* is included.	2.9.2.4	✓			Pg. 10 of PDF, Sec. 5
Proper vehicle operations, including requirements for escorts, are described.	2.9.2.5, 2.9.2.6	✓			Pg. 10 of PDF, Sec. 5
Training requirements for vehicle drivers are addressed.	2.9.2.7	✓			Starting Pg. 9 of PDF, Sec. 5
Two-way radio communications procedures are described.	2.9.2.9	✓			Pg. 11 of PDF, Sec. 5
Maintenance of the secured area of the airport is addressed.	2.9.2.10	✓			Pg. 11 of PDF, Sec. 5
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	2.10	✓			Pg 12 of PDF, Sec. 6

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign Object Debris Management					
The airport operator's FOD management procedures are addressed.	2.11	✓			Pg 12 of PDF, Sec. 7
Hazardous Materials Management					
The airport operator's hazardous materials management procedures are addressed.	2.12	✓			Pg.13 of PDF, Sec. 8
Notification of Construction Activities					
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	2.13	✓			Starting Pg. 13 of PDF, Sec. 9
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	2.13.1	✓			Pg. 13 of PDF, Sec. 9
A list of local ATO/Technical Operations personnel is included.	2.13.1			✓	
A list of ATCT managers on duty is included.	2.13.1			✓	
A list of authorized representatives to the OCC is included.	2.13.2			✓	
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	2.8, 2.13.2, 2.18.3.3.9	✓			Pg. 14 of PDF, Sec. 9
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	2.13.2	✓			Pg. 14 of PDF, Sec. 9
Emergency notification procedures for medical, fire fighting, and police	2.13.3	✓			Pg. 14 of PDF, Sec. 9

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	2.13.4	✓			Pg. 14 of PDF, Sec. 9
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	2.13.5			✓	
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	2.13.5.3.2			✓	
Inspection Requirements					
Daily and interim inspections by both the airport operator and contractor are specified.	2.14.1, 2.14.2	✓			Pg. 12 of the PDF, Sec. 6
Final inspections at certificated airports are specified when required.	2.14.3			✓	
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	2.15	✓			Pg. 15 of the PDF, Sec. 11
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	2.16	✓			Pg. 16 of the PDF, Sec. 12
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	2.17	✓			Pg. 16 of the PDF, Sec.13
Runway and Taxiway Visual Aids - Marking, Lighting, Signs, and Visual NAVAIDs					
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	2.18.1	✓			Starting Pg. 16 of the PDF, Sec. 14
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	2.18.1, 2.18.3, 2.18.4.2, 2.20.2.4			✓	

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
The requirement for markings to be in compliance with AC 150/5340-1, *Standards for Airport Markings,* is specified.	2.18.2	✓			Pg. 17 of PDF, Sec. 14
Detailed specifications for materials and methods for temporary markings are provided.	2.18.2	✓			Pg. 17 of PDF, Sec. 14
The requirement for lighting to conform to AC 150/5340-30, *Design and Installation Details for Airport Visual Aids;* AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified.	2.18.3	✓			Pg. 17 of PDF, Sec. 14
The use of a lighted X is specified where appropriate.	2.18.2.1.2, 2.18.3.2	✓			Pg. 17 of PDF, Sec. 14
The requirement for signs to conform to AC 150/5345-44, *Specification for Runway and Taxiway Signs;* AC 50/5340-18, *Standards for Airport Sign Systems;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified.	2.18.4	✓			Pg. 17 of PDF, Sec. 14
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications.	2.18.4.2			✓	
Hazard Marking and Lighting					
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	2.20.1			✓	

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	2.20.1	✓			Starting Pg. 17 of PDF, Sec. 16 and Sec. 18
The CSPP considers less obvious construction-related hazards.	2.20.1	✓			Starting Pg. 17 of PDF, Sec. 16 and Sec. 18
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	2.20.2.1	✓			Starting Pg. 17 of PDF, Sec. 16
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	2.20.2.1	✓			Starting Pg. 17 of PDF, Sec. 16
Red lights meeting the luminance requirements of the State Highway Department are specified.	2.20.2.2	✓			Starting Pg. 17 of PDF, Sec. 16
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 inch high.	2.20.2.3	✓			Starting Pg. 17 of PDF, Sec. 16
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	2.20.2.3	✓			PLANS and Appendix B
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	2.20.2.5	✓			PLANS and Appendix B
Markings for temporary closures are specified.	2.20.2.5			✓	
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	2.20.2.7	✓			Pg. 18 of PDF, Sec. 16

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Work Zone Lighting for Nighttime Construction					
If work is to be conducted at night, the CSPP identifies construction lighting units and their general locations and aiming in relationship to the ATCT and active runways and taxiways.	2.21	✓			No nighttime work planned. However, Appendix B has provisions.
Protection of Runway and Taxiway Safety Areas					
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	2.22.1.1, 2.22.3.1	✓			Pg. 18 of PDF, Sec. 18
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	2.22.1.2, 2.22.3.2			✓	
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	2.22.3.3			✓	
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open, subject to approved exceptions.	2.22.1.4	✓			Pg. 18 of PDF, Sec. 18
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	2.22.1.4	✓			Pg. 18 of PDF, Sec. 18
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	2.22.1.4	✓			Pg. 18 of PDF, Sec. 18
Grading and soil erosion control to maintain RSA/TSA standards are	2.22.3.5	✓			Pg. 19 of PDF, Sec. 18

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	2.22.2	✓			Pg. 18 of PDF, Sec. 18
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	2.22.3	✓			Pg. 18 of PDF, Sec. 18
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	2.22.4	✓			Pg. 18 of PDF, Sec. 18
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	2.22.4.3.6	✓			Pg. 18 of PDF, Sec. 18
Provisions for protection of runway approach/departure areas and clearways are included.	2.22.6	✓			Pg. 18 of PDF, Sec. 18
Other Limitations on Construction					
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	2.23.1.2	✓			Pg. 19 of PDF, Sec. 19
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	2.23.1.3	✓			Pg. 19 of PDF, Sec. 19

Appendix B
Construction Management Program (CMP)

Construction Management Program

for the

Multi-Unit Hangar Development, Phase 1

Prepared for:
Town of Elizabethtown
805 W Broad Street
Elizabethtown, North Carolina 28337

Prepared by:

WK Dickson & Co., Inc.
720 Corporate Center Drive
Raleigh, North Carolina 27607
NC License No. F-0374

DATE TBD, 2025

WK Dickson Project No. 202407440.00.WK
NCDOA WBS 36237.4.19.1

Report Prepared by: Ayden Chung, PE

Table of Contents

List of Figures

List of Tables

Appendices

1. Project Information

The Town of Elizabethtown, NC (Owner) wishes to continue development at the Curtis L. Brown, Jr. Field (Airport) with a two-unit one-sided 160'x60' hangar and associated asphalt apron on the terminal side of the runway as shown in Figure 1. The Owner has selected WK Dickson, an Ardurra Company (Engineer) to assist with this project.

This Construction Management Program (CMP) details the measures and procedures required to assure compliance with the quality assurance and acceptance provisions of the site development contract for NCDOA WBS 36237.4.19.1 at the Airport. The project area shown includes the proposed hangar building and associated apron. A list of the main project contacts is shown below in Table 1.

Below is a summary of the proposed scope of work for this project which generally consists of the following:

- Issue NOTAM for construction work on the airfield.
- Install erosion control measures, construction entrances, contractor staging areas, haul routes, a new vehicle gate, and lighted barricades.
- Perform earthwork and grading.
- Conduct subgrade proof rolling and preparation for apron and building areas, including testing and a topographic survey.
- Fine grade the building pad area for stone placement and foundation construction.
- Complete utility installations and building construction.
- Install 6-inches of P-209 base course for the apron, including testing and a topographic survey.
- Mill existing Taxiway A3 pavement as noted in the plans for tie-in.
- Install two 2-inch lifts of P-401 asphalt surface course for the apron, including testing and a topographic survey.
- Fine grade and stabilize the site.
- Install temporary pavement markings as per the plans.
- Remove lighted barricades and open the apron and the closed portion of Taxiway A3.

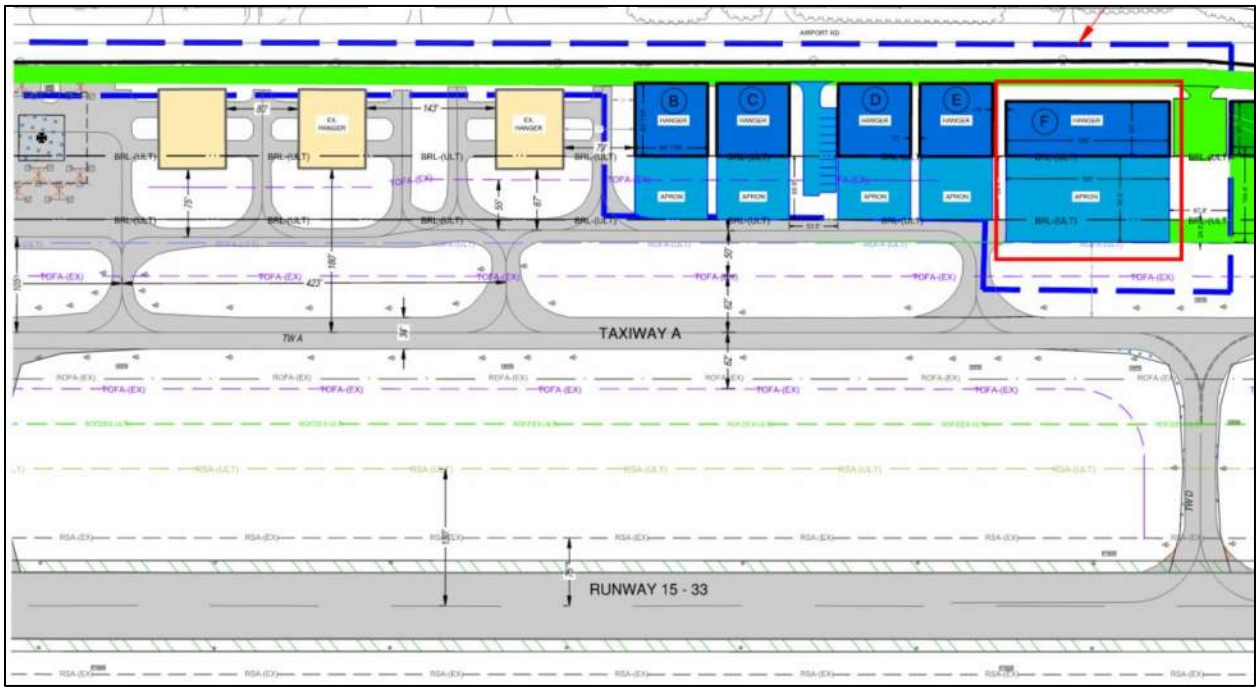


Figure 1 EYF Multi-Unit Hangar Development, Phase 1 Project Area (outlined in **red**)

Table 1 Main Project Contacts

Role	Person Responsible/Contact Information
Project Sponsor/Owner	Dane Rideout, Town Manager P: 910-874-1954 E: drideout@elizabethtownnc.org Rusty Worley, Town Planner P: 910-862-2066 E: rworley@elizabethtownnc.org
North Carolina Department of Aviation (NCDOA)	Tommy Mann, Airport Project Manager P: 919-814-0554 E: tlmann@ncdot.gov
Project Manager/Engineer/Contractor Administration	WK Dickson, an Ardurra Company Jamie Peck, PE, Project Manager P: 540-250-6892 E: jpeck@ardurra.com Ayden Chung, PE, Project Engineer P: 910-442-1852 E: achung@ardurra.com

Role	Person Responsible/Contact Information
Resident Project Representative (RPR)	COMPANY – TBD (QA Field & Lab tests) ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:
Acceptance Testing for Subgrade, Base, & Pavement (Asphalt & Concrete) & Building	COMPANY – TBD (QA Field & Lab tests) ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:
Contractor	COMPANY – TBD ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:
Contractor Quality Control Manager	COMPANY – TBD ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:
Contractor's Quality Control Testing Lab	COMPANY – TBD ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:

Role	Person Responsible/Contact Information
Contractor's Surveyor	COMPANY – TBD ADDRESS CITY, STATE, ZIP NAME, POSITION P: E:

2. Responsibilities

Project Manager/Engineer

Jamie Peck, Project Manager, on behalf of WK Dickson, an Ardurra Company (the "Engineer"), represents the Sponsor as the person with overall responsibility for contract administration of this project. Jamie has the authority to take the necessary actions to monitor the compliance with the contract documents. Ayden Chung shall assist Jamie with the contract administration of this project, as Project Engineer.

Construction Observer

The responsibilities of NAME, Construction Observer/Resident Project Representative, shall include monitoring all aspects of the job, sampling materials for acceptance, coordinating tests on embankment, excavation areas, and pavement materials, reviewing, and analyzing test results, to determine if work is within specification limits, advising the Contractor's Superintendent, Project Manager, and Project Engineer of nonconformance and possible corrective actions, and measuring quantities for payment.

Quality Acceptance Laboratory

QA COMPANY – TBD testing lab duties shall include sampling materials for acceptance and conducting tests on excavation, embankment, base coarse aggregate, hot mix asphalt (HMA), P-610 concrete, and hangar building structural components inspections.

QA COMPANY – TBD personnel assigned to construction testing have received certified training authorizing them to complete the required testing.

All QA testing shall be performed by an (ASTM C1077 and D3666) accredited laboratory and a copy of the current accreditation shall be supplied to the Engineer and Owner, for approval, prior to submitting test results.

Laboratory accreditations for QA COMPANY – TBD and resumes of personnel are included in Appendix A.

Quality Control Laboratory

QC COMPANY – TBD testing lab duties shall include sampling materials for acceptance and conducting tests on excavation, embankment, base coarse aggregate, and P-610 concrete. QC COMPANY – TBD personnel assigned to construction testing have received certified training authorizing them to complete the required testing.

CONTRACTOR – TBD will complete all quality control testing for hot mix asphalt (HMA) for this project. Barnhill Contracting Company personnel assigned to construction testing have received certified training authorizing them to complete the required testing.

All QC testing shall be performed by an (ASTM C1077 and D3666) accredited laboratory and a copy of the current accreditation shall be supplied to the Engineer and Owner, for approval, prior to submitting test results.

Laboratory accreditations for QC COMPANY – TBD and CONTRACTOR – TBD and resumes of personnel are included in Appendix A.

3. Quality Assurance & Control Inspection Procedures

1. Quality Assurance & Control Tests: A list of tests required by the contract specifications can be found in the attached Appendix B. The list includes the referenced specification section, responsible party, and testing requirements. All parties will be informed of their responsibilities. This information will be reviewed at the preconstruction conference and monitored throughout the project.
2. Submittals: The Engineer shall maintain a file containing certifications and submittals required by contract as provided by the Contractor, as well as approvals from the Engineer.
3. The Engineer and/or Resident Project Representative (RPR) will be on site at the beginning of the placement of the base course, asphalt course, and concrete pavement placement for the runway, apron, and taxiways; initial installation of taxiway lights and work in electrical vaults; and prior to and during initial installation of all airfield markings.
4. QA COMPANY – TBD will provide acceptance test reports to the Engineer as soon as the results are available, electronically. Typed copies shall be made available within one (1) working day, delivered via e-mail.
5. QC COMPANY – TBD will provide quality control test reports to CONTRACTOR – TBD, who shall then forward them to the Engineer as soon as the results are available, electronically. Typed copies shall be made available within one (1) working day, delivered via e-mail to the CONTRACTOR – TBD.
6. Material Test Reports: Material test results shall be verbally (upon request) made available to the Engineer within one (1) hour after the test report is completed and typed copies shall be made available within one (1) working day, delivered via e-mail.

7. Test Reports Which Require Corrective Actions: Should test results or observations indicate noncompliance with the project contract, plans, or specifications the following communication and follow-up action will be implemented, as applicable:
    - Verbal notification to the Sponsor, Construction Superintendent, Work Area Foreman and/or Plant Operator.
    - Calibration checks on equipment used to determine the noncompliance item, if applicable.
    - Confirmation of noncompliance through retesting and/or follow-up observations.
    - If a solution to the nonconformance issue is not reached in a reasonable time frame, additional qualified contractor personnel will be contacted to assist in identifying and correcting the problem.
    - If a severe nonconformance problem is detected and a reasonable solution cannot be implemented in a reasonable time frame, the Construction Superintendent will consult with the Engineer and the work will be suspended.
    - The work will not begin again until the Construction Superintendent and Engineer concur that a solution to the problem has been found and successfully implemented.
    - On restarting the work, the nonconforming testing element or observation will be monitored at an appropriate higher frequency for a reasonable amount of time, e.g., double the testing frequency listed.
    - After the area in noncompliance has been repaired, acceptance retesting will resume. The test reports will include failed test number for tracking.

8. Daily Reports: The Engineer and/or RPR will maintain a daily diary summarizing pertinent construction items. Items recorded shall include (as a minimum):
    a. Date
    b. Weather Conditions
    c. Brief Summary of Work Performed
    d. Number of workers on site
    e. Type and Amount of Major Equipment being utilized
    f. Running total of working/calendar days used on project
    g. Significant Directives/Communication with contractor (e.g., regarding construction procedures or material quality)
    h. Summary of QA tests performed that day

i. Arrival/Departure Time of On-Site Inspection Staff

9. Submittal Schedule: The attached Appendix C lists required submittals, referencing the pay item, description, and specification section for the submittal. All required submittals will be reviewed and approved by the Engineer prior to placement of the material.
10. CONTRACTOR'S SURVEYOR – TBD will provide survey staking for horizontal and vertical control. The Contractor's survey staking will be reviewed by the Engineer and approved prior to placement of materials.
11. The finish grade of the taxiway, apron, and parking lot will be verified by the Contractor's licensed surveyor (surveyor must be licensed within the state of North Carolina). The documentation shall be provided to the Engineer for review and approval prior to the final acceptance of the subject pavement.
12. The RPR and acceptance testing lab personnel shall maintain all acceptance test reports and provide copies to the Engineer as soon as results are available.
13. CONTRACTOR – TBD and QA COMPANY – TBD will prepare a final project construction material testing and acceptance report that includes a summary of all quality control and acceptance tests results, quantity of materials, and all weekly reports. This information shall be compiled and submitted to the Engineer for inclusion as an appendix to the Final Construction Report, which will be completed by the Engineer. Actual test reports shall be available upon request.

Appendix A
Resumes and Lab Certifications

INFORMATION TO BE ADDED TO THE APPENDIX UPON CONTRACT AWARD AND CONTRACTOR SELECTION

Appendix B
List of Required Tests

Disclaimer: This list of required tests has been generated as a tool to aid the Contractor throughout the construction project. However, it may not be all-inclusive. The Contractor must be fully aware of all required testing and is responsible for ensuring compliance with all contract documents, relevant standards, codes, and regulations.

INFORMATION TO BE ADDED TO THE APPENDIX UPON CONTRACT AWARD AND CONTRACTOR SELECTION

Appendix C
List of Required Submittals

Disclaimer: This list of required tests has been generated as a tool to aid the Contractor throughout the construction project. However, it may not be all-inclusive. The Contractor must be fully aware of all required testing and is responsible for ensuring compliance with all contract documents, relevant standards, codes, and regulations.

INFORMATION TO BE ADDED TO THE APPENDIX UPON CONTRACT AWARD AND CONTRACTOR SELECTION

Appendix C
ECS Geotechnical Engineering Reports

Geotechnical Engineering Report for EYF Hangar Development Phase 1 and 2

ECS Southeast, LLC

Geotechnical Engineering Report

EYF Hangar Development Phase 1 and 2

466 Airport Road
Elizabethtown, Bladen County, NC

ECS Project No. 33:7114

December 6, 2024

December 6, 2024

Ms. Jamie Peck
W.K. Dickson & Co., Inc.
720 Corporate Center Drive
Raleigh, NC 27607

ECS Project No. 33:7114

Reference: Geotechnical Engineering Report
EYF Hangar Development Phase 1 and 2
466 Airport Road
Elizabethtown, Bladen County, NC

Dear Ms. Peck:

ECS Southeast, LLC (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering evaluation for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to W.K. Dickson & Co., Inc. during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and also provide our services during construction phase operations to verify subsurface conditions identified for this report. Should you have questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Southeast, LLC

Victor McDuffee, P.E.
Senior Project Engineer
VMcDuffee@ecslimited.com

John Kent, P.E.
Principal Engineer
JKent@ecslimited.com

TABLE OF CONTENTS

APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagrams
- Generalized Subsurface Profiles

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Subsurface Exploration Procedure: Standard Penetration Testing (SPT)
- Boring Logs

Appendix C – Laboratory Testing

- Laboratory Testing Summary
- Plasticity Charts
- Moisture-Density Relationship Curves
- CBR Test Results

EXECUTIVE SUMMARY

This Executive Summary is intended as a very brief overview of the primary geotechnical conditions that are expected to affect design and construction. Information gleaned from this Executive Summary should not be utilized in lieu of reading the entire geotechnical report.

- Provided that soft or unsuitable existing fill or natural subgrade soils are remediated, and subgrades are prepared and new Engineered Fill installed in accordance with the *Construction Recommendations* of this report, the proposed buildings may be supported on shallow column and strip footings utilizing a net allowable bearing pressure of 3,000 psf.
- Based on site specific test boring results and our interpretation of the current IBC Standards, it is our opinion that a Seismic Site Class “E” can be used for this site.
- ECS should be retained to review the design documents for conformance with our recommendations.
- ECS should be retained for construction materials testing and special inspections to facilitate proper implementation of our recommendations.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to provide geotechnical information for the design of the proposed building foundations, floor slabs, and pavements. According to information provided to ECS, the proposed project consists of the construction of two airport hangar buildings and access road and apron pavements.

The recommendations developed for this report are based on the results of our subsurface exploration and project information provided by W.K. Dickson & Co., Inc. This report contains the results of our subsurface exploration and laboratory testing programs, site characterization, engineering evaluation, and recommendations for the design and construction of the planned development.

1.2 SCOPE OF SERVICES

The purposes of this exploration were to explore the soil and groundwater conditions at the site and to develop engineering recommendations to guide design and construction of the proposed project.

We accomplished the purposes of the study by:

- Reviewing the available publications concerning local geology of the site and performing a general site reconnaissance.
- Drilling borings to explore the subsurface soil and groundwater conditions.
- Performing laboratory tests on selected representative soil samples from the borings to evaluate pertinent engineering properties.
- Evaluating the field and laboratory data to develop appropriate engineering recommendations.

1.3 AUTHORIZATION

Our services were provided in accordance with our Proposal No. 33:6295-GP-R1, dated May 24, 2024, as authorized by W.K. Dickson & Co., Inc. with an Aviation Subconsultant Contract for Professional Services with ECS Southeast, LLC dated October 14, 2024.

2.0 PROJECT INFORMATION

This report is based on the following sources of information:

- Emails between Jamie Peck with W.K. Dickson and Annemarie Crumrine with ECS on May 10, 2024.
- Emails between Jamie Peck with W.K. Dickson and Victor McDuffee with ECS on May 22, 2024.
- "Geotechnical Engineering Subsurface Investigation Request for Proposal – Hangar Development Phase 1" prepared by W.K. Dickson dated May 10, 2024.
- "Airport Layout Plan – Hangar Development" prepared by W.K. Dickson dated May 9, 2024.
- Google Earth aerial photos dated between February 1993 and October 2023.
- Site and topographic information obtained from Google Earth and Bladen County topographic maps.
- Geologic Map of North Carolina.
- Web Soil Survey Soil Map and soils data.

2.1 SITE INFORMATION

The site is located within the Curtis L. Brown, Jr. Field Airport at 466 Airport Road in Elizabethtown, North Carolina. A Site Location Diagram is provided in Appendix A (Figure 1).

The site appears to consist of open grassed areas and existing pavement. The existing grade onsite is relatively level. The ESRI imagery below shows the general existing conditions of the site.

Current Site Condition

2.2 PROPOSED CONSTRUCTION

The following information represents our understanding of the planned development including proposed hangar buildings and related infrastructure.

SUBJECT	DESIGN INFORMATION / ASSUMPTIONS
Building Footprint	Approximately 10,800 square feet in plan view
# of Stories	1 story above grade, high bay (estimated)
Usage	Aircraft storage and office
Framing	Steel-framed (assumed)
Column Loads	100 kips, maximum unfactored (estimated)
Wall Loads	3 kips per linear foot (klf), maximum unfactored (estimated)
Floor Elevation	Not available at the time of this report

The structural engineer should verify these assumptions and notify ECS if the actual unfactored foundation design loads exceed or are significantly less than these assumed values.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

To explore the subsurface conditions at this site, eighteen (18) soil test borings and two (2) asphalt cores were performed in the proposed development areas to depths below existing grades as shown below.

Boring No.	Proposed Structure/Site Feature	Boring Depth (feet)
B-01 to B-08	Building	20 to 50
P-01 to P-10	Pavement	10
C-01 and C-02	Existing Pavement Core	1

The borings were located by an ECS representative using a handheld GPS unit and their approximate locations are shown on the Boring Location Diagrams (Figures 2 and 3) in Appendix A. Our exploration procedures are explained in greater detail in Appendix B including the insert titled Subsurface Exploration Procedure: Standard Penetration Testing (SPT).

Please note that the ground surface elevations shown on the boring logs and subsurface profiles were not surveyed by a licensed surveyor. These elevations were interpolated using topographic information obtained from the Bladen County GIS website and Google Earth. They should be considered approximate.

3.1 SUBSURFACE CHARACTERIZATION

3.1.1 Regional Geology

The site is located within the Coastal Plain physiographic province. The Coastal Plain is typically characterized by marine, alluvial, and aeolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. Basal formations are typical of those laid down in a shallow sloping sea bottom; dense sand, consolidated clay, limestone, chalk, marl, claystone, and sandstone. Overburden

soils include marine interbedded gravel, sand, silt, and clay. Many of the clays have been preconsolidated by desiccation from frequent rising and lowering of the sea level and groundwater table. Alluvial gravel, sand, silt, and clay are typically present near rivers and creeks.

The top of the coastal formations on the geologic map are typically on the order of 30 to 100 feet below the ground surface, but can be less in the upper Coastal Plain near the fall line between the Piedmont and Coastal Plain. They represent basal, relatively hard formations with consistency over large areas.

According to the 1985 Geologic Map of North Carolina, the site is underlain by the Black Creek Formation of Cretaceous age (Kb). This formation consists of gray to black, lignitic, contains thin beds of laminae of fine-grained micaceous sand and thick lenses of cross-bedded sand. Patches of glauconitic, fossiliferous clayey sand lenses can be present in the upper part of this formation.

3.1.2 Soil Conditions

Data from the soil test borings is included on the logs in Appendix B. The subsurface conditions summarized below and those shown on the boring logs represent an estimate of the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgments. We note that the transition between different soil strata is usually less distinct than those shown on the boring logs. Please refer to individual boring logs that are contained in Appendix B.

Stratum	Description	Ranges of SPT (1) N-values (bpf (2))
N/A	**Topsoil** – An approximate topsoil thickness of 1 to 2 inches was encountered at the test boring locations. Thicknesses are expected to be variable across the project site. Observed topsoil depths do not include root balls which could be significantly deeper.	N/A
I	**Natural Soils** – Beneath the topsoil are natural soils described as very loose to dense poorly graded Sand with Silt/silty Sand/clayey Sand (SP-SM/SM/SC).	2 to 38

Notes: (1) Standard Penetration Testing.
(2) bpf – Blows per foot.

3.2 GROUNDWATER OBSERVATIONS

The water levels measured in the borings are contained on the logs in Appendix B. The groundwater level depths and elevations measured at the time of drilling are summarized in the table below. Variations in the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors.

Boring No.	*Estimated Top Elev. (ft)	Estimated Bottom Elev. (ft)	At Time of Drilling GWT Depth (ft)	At Time of Drilling GWT EL (ft)	End of Drilling GWT Depth (ft)	End of Drilling GWT Depth (ft)	Cave-In Depth (ft)	Estimated Cave-In EL (ft)
B-01	130.0	110.0	9.0	121.0	12.0	118.0	13.0	117.0
B-02	129.0	109.0	9.0	120.0	10.0	119.0	12.7	116.3
B-03	130.0	110.0	9.0	121.0	12.0	118.0	13.0	117.0
B-04	129.0	79.0	NE	NE	NE	NE	22.0	107.0
B-05	130.0	110.0	9.0	121.0	12.0	118.0	12.0	118.0

Boring No.	*Estimated Top Elev. (ft)	Estimated Bottom Elev. (ft)	At Time of Drilling GWT Depth (ft)	At Time of Drilling GWT EL (ft)	End of Drilling GWT Depth (ft)	End of Drilling GWT Depth (ft)	Cave-In Depth (ft)	Estimated Cave-In EL (ft)
B-06	130.0	110.0	14.0	116.0	10.0	120.0	11.3	118.7
B-07	130.0	110.0	13.0	117.0	12.0	118.0	13.0	117.0
B-08	130.0	110.0	14.0	116.0	11.0	119.0	12.0	118.0
P-01	129.0	119.0	9.0	120.0	NE	NE	6.0	123.0
P-02	127.0	117.0	9.0	118.0	NE	NE	8.8	118.2
P-03	128.0	118.0	9.0	119.0	NE	NE	8.7	119.3
P-04	128.0	118.0	9.0	119.0	NE	NE	8.0	120.0
P-05	131.0	121.0	NE	NE	NE	NE	8.3	122.7
P-06	129.0	119.0	NE	NE	NE	NE	8.0	121.0
P-07	130.0	120.0	9.0	121.0	NE	NE	8.6	121.4
P-08	130.0	120.0	NE	NE	NE	NE	8.3	121.7
P-09	131.0	120.0	NE	NE	NE	NE	9.0	122.0
P-10	130.0	120.0	NE	NE	NE	NE	8.8	121.2

Note: Elevations are approximate - estimated from GPS position and provided site topographic information.

3.3 LABORATORY TESTING

The samples recovered from the borings were visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and including USCS classification symbols, and ASTM D2487 Standard Practice for Classification for Engineering Purposes (Unified Soil Classification System (USCS)). After classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

Classification and index property tests were performed by ECS on representative soil samples obtained from the test borings to aid in classifying soils according to the Unified Soil Classification System and to quantify and correlate engineering properties. Laboratory testing included moisture content, Atterberg limits, percentage of fines by washing with the No. 200 sieve, modified Proctor compaction, and California Bearing Ratio. The results of the laboratory testing program are included in Appendix C.

4.0 DESIGN RECOMMENDATIONS

4.1 FOUNDATIONS

4.1.1 Conventional Shallow Footings

Provided subgrades and Engineered Fills are prepared as recommended in this report, the proposed structures can be supported by shallow foundations including column footings and continuous wall footings. We recommend the foundation design use the following parameters.

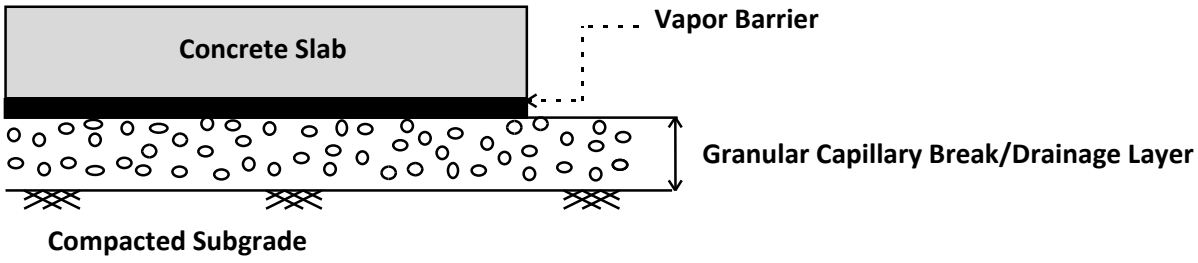
Design Parameter	Column Footing	Wall Footing
Net Allowable Bearing Pressure (1)	3,000 psf	3,000 psf
Acceptable Bearing Soil Material	New Engineered Fill and competent natural soils	
Minimum Width	24 inches	24 inches
Minimum Footing Embedment Depth (Below slab or outside finished grade) (2)	12 inches	12 inches
Estimated Total Settlement (3)	Less than 1 inch	Less than 1 inch
Estimated Differential Settlement (4)	Less than ½-inch	Less than ½-inch

Notes:
(1) Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.
(2) For bearing considerations and frost penetration requirements.
(3) Based on assumed structural loads. If final loads are different, ECS must be contacted to update foundation recommendations and settlement calculations.
(4) Based on maximum column/wall loads and variability in borings. Differential settlement can be re-evaluated once the foundation plans are more complete.

Potential Undercuts: Most of the soils at the foundation bearing elevation are anticipated to be suitable for support of the proposed structures. If soft or unsuitable soils are observed at the footing bearing elevations, the unsuitable soils should be undercut and removed. Undercuts should be backfilled with lean concrete/flowable fill ($f'_c \geq 1{,}000$ psi at 28 days) or Engineered Fill up to the original design bottom of footing elevation. Once remedial work is complete, the original footing should be constructed on top of the improved subgrade.

4.2 SLABS ON GRADE

It appears that the slabs will bear on a combination of new Engineered Fill and natural soils. Some of the on-site natural soils are considered suitable for support of the floor slabs. Within the building footprints there may be areas of soft or yielding soils that should be removed and replaced with compacted Engineered Fill in accordance with the recommendations included in this report. The following graphic depicts our soil-supported slab recommendations:



1. Drainage Layer Thickness: 4 inches
2. Drainage Layer Material: granular material such as ABC having a maximum aggregate size of 1.5 inches and no more than 10 percent fines.
3. Subgrade compacted to *98%* maximum dry density per ASTM D698.

Subgrade Modulus: Provided Engineered Fill and the Granular Drainage Layer are constructed in accordance with our recommendations, the slabs may be designed assuming a modulus of subgrade reaction, k_1, of 170 pci (lbs./cu. inch).

Vapor Barrier: Before the placement of concrete, a vapor barrier may be placed on top of the granular drainage layer to provide additional protection against moisture vapor penetration through the floor slabs. When a vapor barrier is used, special attention should be given to surface curing of the slabs to reduce the potential for uneven drying, curling and/or cracking of the slabs. Depending on proposed flooring material types, the Structural Engineer of Record and/or the Project Architect may choose to eliminate the vapor barrier.

High Floor Load Areas: Areas with high floor loads, such as storage rack systems or systems with limited slab tolerances will likely require special floor slab subgrade preparation or support. These areas should be brought to the attention of ECS for further evaluation and recommendations. The above modulus of subgrade reaction value should not be used for wide area storage areas, such as uniform or rack storage systems. Instead, the modulus of subgrade reaction (K) used to design heavily loaded areas should be reduced to approximately one-half to one-third of the above value, depending upon the severity of loading.

Slab Isolation: Soil-supported slabs should be isolated from the foundations and foundation-supported elements of the structure so that differential movement between the foundations and slab will not induce excessive shear and bending stresses in the floor slab. Where the structural configuration restricts the use of a free-floating slab such as in a drop down footing/monolithic slab configuration, the slab should be designed with adequate reinforcement and load transfer devices to reduce overstressing of the slab.

The above should be considered general guidance to assist the Owner/Developer and design team. Project specific designs, plan details or other input from the Structural Engineer of Record should control.

4.3 BUILDING RETAINING WALLS

If the proposed structures include below grade retaining walls, they should be designed and constructed in accordance with the following recommendations.

Lateral Earth Pressures: Below grade building retaining walls should be designed to withstand the lateral earth pressures exerted by the backfill. It is anticipated that retaining walls associated with the buildings will be rigid walls restrained from rotation by the floor slab. For rigid walls, the "At Rest" (K_o) soil condition should be used in the wall design and evaluation. For walls that are free to deflect at their tops, the "Active" (K_a) soil condition should be used in the wall design and evaluation.

Soil Parameters: In the design of retaining wall structures, the following soil parameters were estimated based on local experience. These parameters anticipate that Granular Soils meeting the requirements recommended herein for Retaining Wall Backfill will comprise the backfill in the Critical Zone. The Critical Zone is defined as the area between the back of the retaining wall structure and an imaginary line projected upward and rearward from the bottom back edge of the wall footing at a 45-degree angle.

Retaining Wall – Select Backfill (<12% fines)

Soil Parameter	Estimated Value
Coefficient of Earth Pressure at Rest (K_o)	0.47
Coefficient of Active Earth Pressure (K_a)	0.31
Retained Soil Moist Unit Weight (γ)	120 pcf
Cohesion (C)	0 psf
Angle of Internal Friction (ϕ)	32°

Retaining Wall – On-Site Silty Sand (fines 12% to 35%)

Soil Parameter	Estimated Value
Coefficient of Earth Pressure at Rest (K_o)	0.53
Coefficient of Active Earth Pressure (K_a)	0.36
Retained Soil Moist Unit Weight (γ)	110 pcf
Cohesion (C)	0 psf
Angle of Internal Friction (ϕ)	28°

Retaining Wall Backfill: Soils used as select granular backfill within the Critical Zone behind retaining walls should have USCS classifications of SP, SP-SM, SW, or SW-SM with a maximum of 12% fines (i.e., % passing the No. 200 Sieve) and a minimum angle of internal friction of 32 degrees when compacted to at least 95% of standard Proctor maximum dry density (ASTM D698). Existing soil not meeting these criteria should be removed from the Critical Zone of the walls, as determined by ECS personnel at the time of construction.

As a cost saving alternative, on-site silty Sand (SM) soils having between 12% and 35% fines could be used for backfill behind cast-in-place walls if a vertical geosynthetic drain board is placed against the back wall face to enhance drainage.

Foundation Wall Drains: Below-grade building retaining walls should be provided with damp proofing and a foundation drainage system to relieve hydrostatic pressures which may develop in the wall backfill. This system should consist of a 4-inch perforated, closed joint drain line located along the backside of the walls above the top of the footing. The drain line should be surrounded by a minimum of 6 inches of AASHTO No. 57 Stone wrapped with an approved nonwoven filter fabric, such as Mirafi 140-N, or equivalent.

4.4 SEISMIC DESIGN CONSIDERATIONS

The International Building Code (IBC) requires site classification for seismic design based on the upper 100 feet of a soil profile. The Standard Penetration Resistance (N-value) method was utilized in classifying site. Based on site specific test boring results and our interpretation of the current IBC Standards, it is our opinion that a Seismic Site Class E can be used for this site.

4.5 PAVEMENTS

Subgrade Characteristics: Based on the results of our soil test borings and anticipated site grading, we expect the soils that will be exposed as pavement subgrades, exposed in cuts, and placed as fill will consist mainly of sand with silt (SP-SM), silty sand (SM) and clayey sand (SC).

California Bearing Ratio (CBR) testing was performed on bulk soil samples obtained at the locations of borings P-03 and P-08. The tested soils demonstrated CBR values of 19 and 21.3. For design purposes, we recommend a CBR value of 8.

The soil subgrade should be smooth-rolled and proofrolled prior to P-209 placement. Areas that pump, rut, or are otherwise unstable should be re-compacted or undercut and replaced. The P-209 should be compacted to at least 98 percent of modified Proctor maximum dry density per ASTM D1557 or AASHTO T-180 (as modified by NCDOT), provided nuclear density testing is performed. To confirm that the required degree of compaction is being achieved, field compaction testing should be performed in each P-209 lift by the geotechnical engineer's representative.

5.0 SITE CONSTRUCTION RECOMMENDATIONS

5.1 SUBGRADE PREPARATION

5.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping vegetation, rootmat, topsoil, existing fill, and soft, loose, or unsuitable materials from the proposed areas of construction and 5 feet beyond the toe of Engineered Fills. Borings performed on site contained an observed 1 to 2 inches of topsoil. Deeper topsoil or organic laden soils may be present in wet, low-lying, and poorly drained areas. In wooded areas, the root balls may extend as deep as about 2 feet and will require additional localized stripping depth to completely remove the organics. ECS should be retained to verify that topsoil and unsuitable surficial materials have been removed prior to the placement of Engineered Fill or construction of structures.

5.1.2 Removal of Utilities

Any existing utilities that will no longer be in service should be completely removed from the new building footprints. Active utilities should be re-routed around the buildings, wherever possible, and the abandoned section of utility completely removed from the proposed building areas. If active utilities are to remain within the building footprints, these utilities should be reviewed by the project structural engineer for conflicts and clearly identified on the construction plans. Special foundation construction procedures may be required to support the new building foundations over utilities.

Excavations resulting from the removal of the above items should be backfilled with new Engineered Fill as discussed in the following section of this report. This should be observed on a full-time basis by a representative of ECS to document that the unsuitable materials have been removed and that the subgrade is suitable for support of the proposed construction and/or fills.

5.1.3 Proofrolling

Prior to fill placement or other construction on subgrades, the subgrades should be evaluated by ECS. The exposed subgrade should be thoroughly proofrolled with construction equipment having a minimum axle load of 10 tons [e.g., fully loaded tandem-axle dump truck]. Proofrolling should be traversed in two perpendicular directions with overlapping passes of the vehicle under the observation of ECS. This procedure is intended to assist in identifying localized yielding materials.

Where proofrolling identifies areas that are yielding or "pumping," those areas should be repaired prior to the placement of subsequent Engineered Fill or other construction materials. Methods of stabilization include undercutting, moisture conditioning, or chemical stabilization. The situation should be discussed with ECS to determine the appropriate procedure. Test pits may be excavated to explore the shallow subsurface materials to help in determining the cause of the observed yielding materials, and to assist in the evaluation of appropriate remedial actions to create a firm and unyielding subgrade.

5.1.4 Site Temporary Dewatering

The contractor should make their own assessment of temporary dewatering needs based upon the limited subsurface groundwater information presented in this report. Soil sampling is not continuous, and thus soil and groundwater conditions may vary between sampling intervals (typically 5 feet). If the contractor believes additional subsurface information is needed to assess dewatering needs, they should obtain such information at their own expense. ECS makes no warranties or guarantees regarding the adequacy of the provided information to determine dewatering requirements; such recommendations are beyond our scope of services.

5.2 EARTHWORK OPERATIONS

5.2.1 Excavation Considerations

Excavation Safety: Excavations and slopes should be made and maintained in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing and constructing stable, temporary excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Excavatability: Based on the assumed design grades, we anticipate that most of the natural soils encountered in the test borings can be removed with conventional earth excavation equipment such as track-mounted backhoes, loaders, or bulldozers.

5.2.2 Existing Man-Placed Fill

Existing fill encountered during excavation should be undercut to a minimum depth of 1 foot in pavement areas. In building areas, the depth and extent of undercut for the existing fill should be

determined by ECS based on actual field conditions. The subgrade should then be proofrolled to determine if additional undercuts are required. ECS personnel should confirm that fill removal has been suitably accomplished.

5.2.3 Potentially Expansive Soils

Potentially expansive soils are those soil materials classified as elastic Silt (MH) and fat Clay (CH). These soils were not evident at the boring locations. If expansive soils are encountered at design subgrade elevations, the subgrade should be undercut a minimum of 2 feet for bottom of footings and slabs-on-grade and a minimum 1 foot for bottom of pavement base course and the grades restored with approved low plasticity Engineered Fill (LL<40, PI<20).

5.2.4 Suitability of On-Site Soils for Reuse as Engineered Fill

On-Site Borrow Suitability: The on-site soils meeting the classifications for recommended Engineered Fill, plus meeting the restrictions on separation distances, organic content, and debris, may be used as Engineered Fill. Most of the soils encountered in the borings within the anticipated excavation depths are expected to be suitable for use as Engineered Fill.

Engineered Fill Materials: Materials for use as Engineered Fill should consist of inorganic soils with the following engineering properties and compaction requirements.

ENGINEERED FILL SOIL INDEX PROPERTIES	
Subject	**Property**
Soil Classification	CL, ML, SM, SC, SW, SP, GW, GM or GC
Maximum Particle Size	3 inches
LL and PI for Fill in Building and Pavement Areas	LL $\leq$ 40, PI $\leq$ 20
Minimum Dry Unit Weight (in place)	$\geq$ 95 pcf
Maximum Organic Content	4% by dry weight

ENGINEERED FILL COMPACTION REQUIREMENTS	
Subject	**Requirement**
Compaction Standard	Standard Proctor (ASTM D698)
Required Compaction	95% of Maximum Dry Density (98% in the top 1 foot)
Moisture Content	$\pm$3 % points of the soil's optimum value
Loose Thickness	8 inches prior to compaction

Poor Quality Fill Materials: Poor quality fill includes materials which do not satisfy the requirements for Engineered Fill, such as topsoil, organic materials, debris, debris-laden fill, and highly plastic soils such as ELASTIC SILT (MH) and FAT CLAY (CH).

Fill Placement Considerations: Fill materials should not be placed on frozen soils, on frost-heaved soils, and/or on excessively wet soils. Borrow fill materials should not contain frozen materials at the time of placement, and frozen or frost-heaved soils should be removed prior to placement of Engineered Fill or other fill soils and aggregates. Excessively wet soils or aggregates should be scarified, aerated, and moisture conditioned. Fill material should be placed in horizontal lifts. Proper drainage should be maintained during the earthwork phases of construction to avoid ponding of water which can lead to degradation of the subgrade soils.

Subgrade Benching: In fill areas, new soil embankments should be constructed from the bottom up. End dumping from the top of the slope should not be permitted. Fill should not be placed on ground with a slope steeper than 5H:1V. Where steeper slopes exist, the ground should be benched to allow for fill placement on a horizontal surface. Each fill layer should be benched into the existing slope for stability.

Retaining Walls: Please refer to **Section 4.3 Building Retaining Walls** for appropriate soils recommended as suitable fill for constructing retaining walls.

5.3 FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are made. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 1 to 3-inch thick “mud mat” of “lean” concrete should be placed on the bearing soils before the placement of reinforcing steel.

Footing Subgrade Observations: We anticipate that some of the soils at the foundation bearing elevation are anticipated to be suitable for support of the proposed structures. It is important to have the Geotechnical Engineer of Record (ECS), or their authorized representative, observe the foundation subgrade prior to placing foundation concrete, to confirm the bearing soils are what was anticipated.

Slab Subgrade Verification: Prior to placement of a drainage layer, the subgrade should be prepared in accordance with the recommendations found in **Section 5.1.3 Proofrolling**.

5.4 UTILITY INSTALLATIONS

Utility Subgrades: The soils encountered in our exploration are expected to be generally suitable for support of utility pipes. The pipe subgrades should be observed and probed for stability by ECS. Loose or unsuitable materials encountered should be removed and replaced with suitable compacted Engineered Fill, or pipe stone bedding material.

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the civil engineer’s project drawings and specifications. We recommend that the bedding materials be placed up to the springline of the pipe. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the requirements for Engineered Fill and Fill Placement.

5.5 ADDITIONAL CONSIDERATIONS

Climate During Construction: During the cooler and wetter periods of the year, delays and additional earthwork costs should be anticipated. At these times, reduction of soil moisture may need to be accomplished by a combination of mechanical manipulation and the use of chemical additives, such as lime or cement, to lower moisture contents to levels appropriate for compaction. Alternatively, during the drier times of the year, such as the summer months, moisture may need to be added to the soil to provide adequate moisture for successful compaction according to the project requirements.

Limit Site Disturbance: Measures should also be taken to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including structural and pavement areas.

Foundation Excavation: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are dug. If surface water intrusion or exposure softens the bearing soils, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, we recommend that the foundations be covered or otherwise protected.

Drainage: Positive site drainage should be maintained during earthwork operations, which should help maintain the integrity of the soil. Placement of fill on the near surface soils, which have become saturated, could be very difficult. When wet, these soils will degrade quickly with disturbance from contractor operations and will be extremely difficult to stabilize for fill placement. The surface of the site should be kept properly graded to enhance drainage of the surface water away from the proposed structure areas during the construction phase. We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern.

Undercut: *Where unacceptable materials are encountered, they must be evaluated and may need to be undercut and replaced with Engineered Fill or improved by re-compaction.*

Temporary Cut Slopes: We recommend temporary cut slopes without seepage be constructed no steeper than 1.5H:1V.

6.0 CLOSING

ECS has prepared this report to guide the geotechnical-related design and construction aspects of the project. We performed these services in accordance with the standard of care expected of professionals in the industry performing similar services on projects of like size and complexity at this time in the region. No other representation, express or implied, and no warranty or guarantee is included or intended in this report. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

The description of the proposed project is based on information provided to ECS by W.K. Dickson Co., Inc. If any of this information is inaccurate or changes, either because of our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted so we can review our

recommendations and provide additional or alternate recommendations that reflect the proposed construction.

We recommend that ECS review the final project plans and specifications so we can confirm that those plans/specifications are in accordance with the recommendations of this geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendations. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. We would be pleased to provide an estimated cost for these services at the appropriate time.

This report is provided for the exclusive use of W.K. Dickson Co., Inc. and their project specific design team. This report is not intended to be used or relied upon in connection with other projects or by other third parties. ECS disclaims liability for any such third-party use or reliance without express written permission.

APPENDIX A – Diagrams & Reports

Site Location Diagram
Boring Location Diagram
Generalized Subsurface Profiles

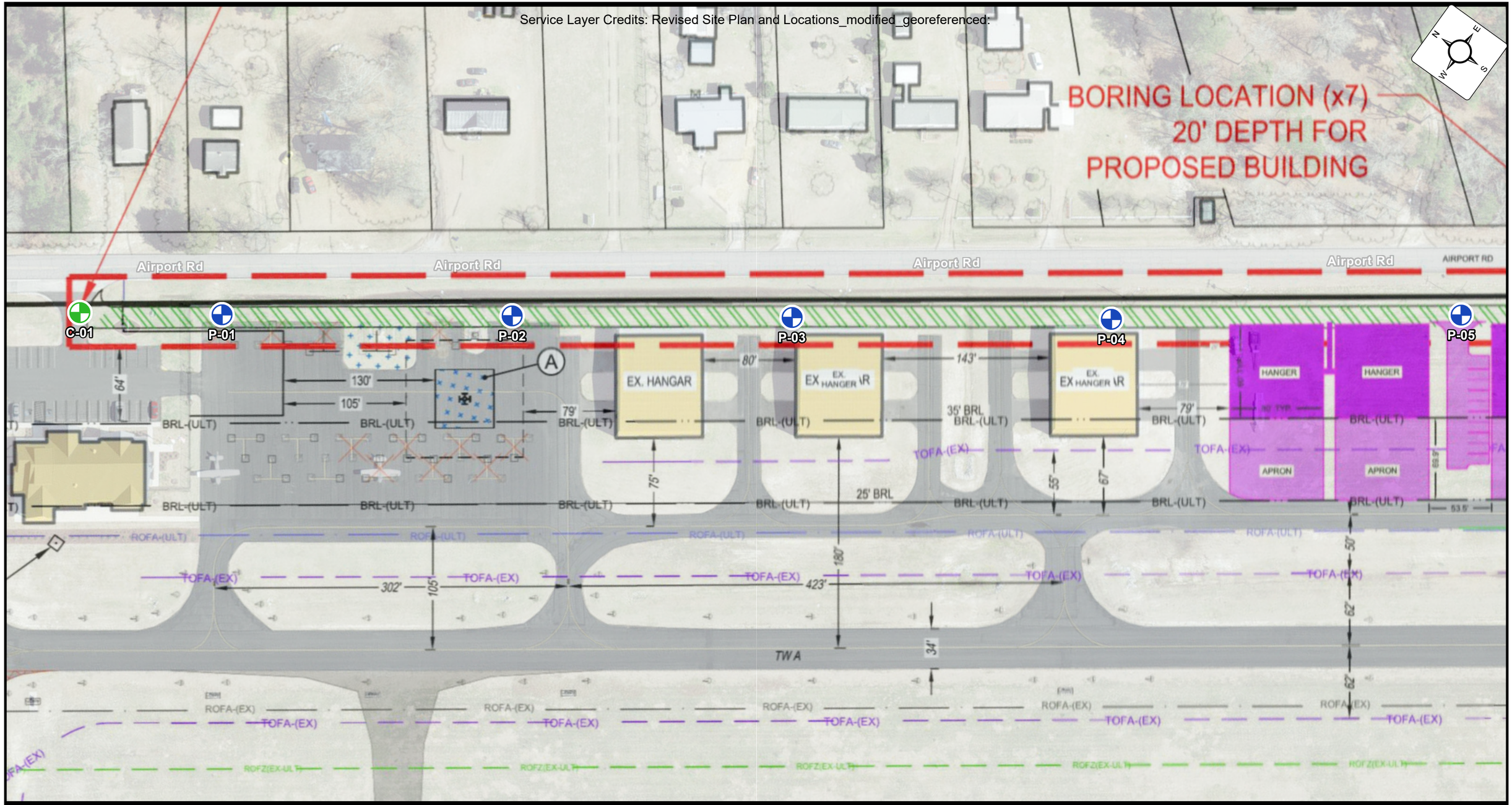
BORING LOCATION DIAGRAM

EYF Hangar Development Phase 1 and 2

466 Airport Rd, Elizabethtown, North Carolina
WK Dickson & Co., Inc.

ENGINEER	JK01
SCALE	1" = 1500'
PROJECT NO.	33:7114
SHEET	1 of 3
DATE	11/27/2024

Service Layer Credits: Revised Site Plan and Locations_modified_georeferenced:



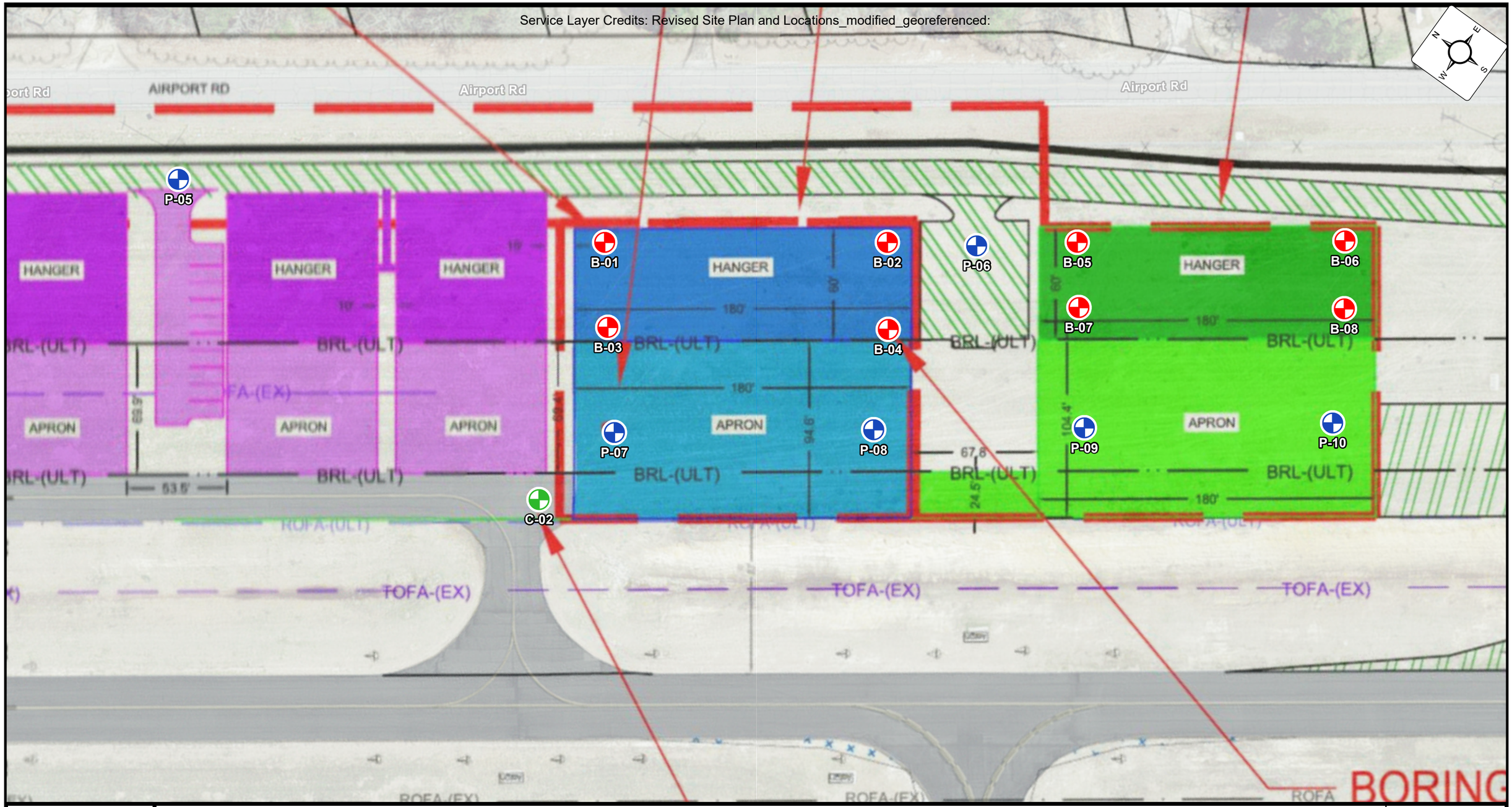
BORING LOCATION DIAGRAM

EYF Hangar Development Phase 1 and 2

466 Airport Rd, Elizabethtown, North Carolina
WK Dickson & Co., Inc.

ENGINEER	JK01
SCALE	1" = 80'
PROJECT NO.	33:7114
SHEET	2 of 3
DATE	10/22/2024

Service Layer Credits: Revised Site Plan and Locations_modified_georeferenced:

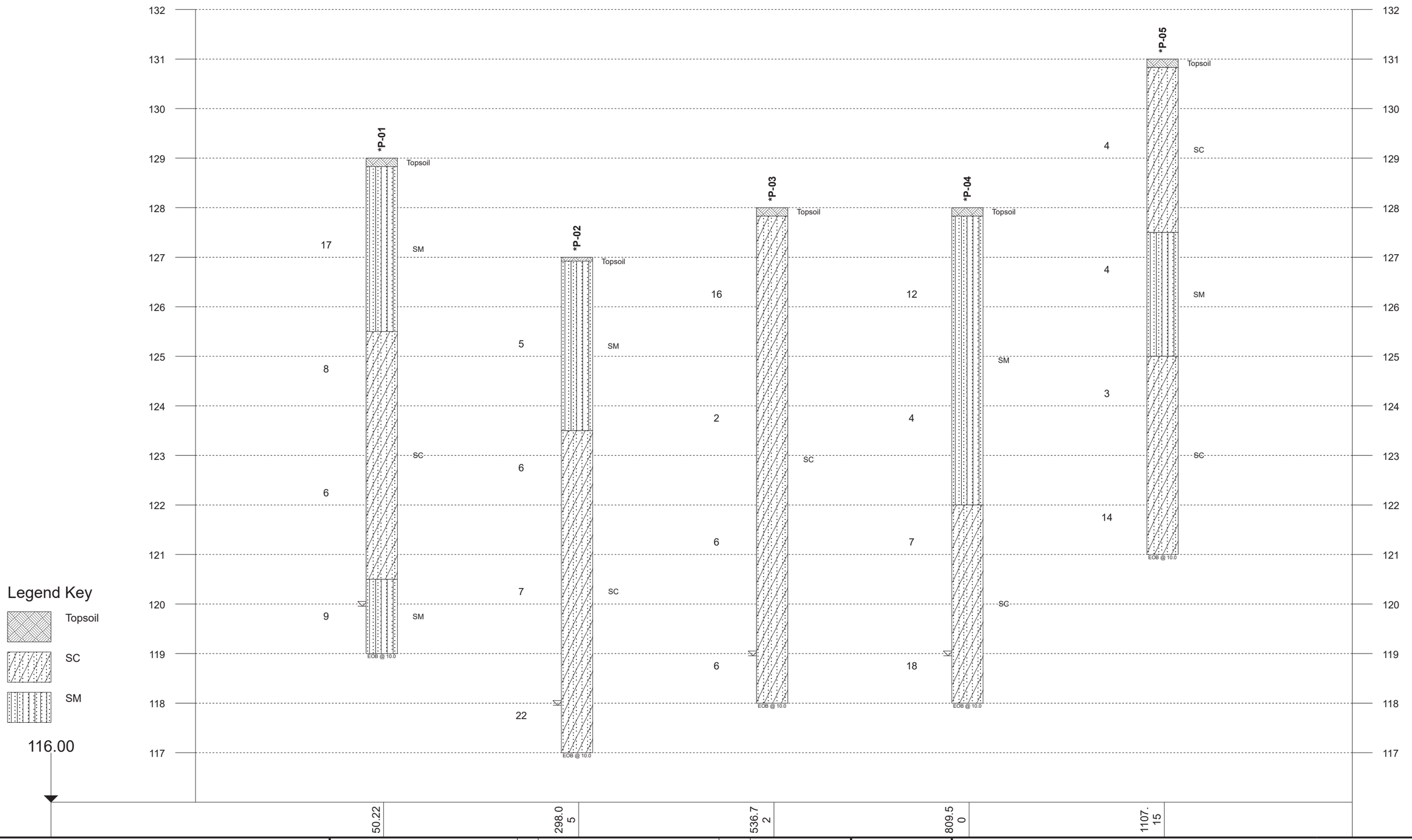


BORING LOCATION DIAGRAM

EYF Hangar Development Phase 1 and 2

466 Airport Rd, Elizabethtown, North Carolina
WK Dickson & Co., Inc.

ENGINEER	JK01
SCALE	1" = 50'
PROJECT NO.	33:7114
SHEET	3 of 3
DATE	10/22/2024



Legend Key

- Topsoil
- SC
- SM

116.00

Notes:

1- EOB: END OF BORING AR: AUGER REFUSAL SR: SAMPLER REFUSAL.
2- THE NUMBER BELOW THE STRIPS IS THE DISTANCE ALONG THE BASELINE.
3- SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
4- STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).

Plastic Limit Water Content Liquid Limit
X———●———△
[FINES CONTENT %]

BOTTOM OF CASING

LOSS OF CIRCULATION (100%)

WL (First Encountered)

WL (Completion)

WL (Seasonal High Water)

WL (Stabilized)

Fill

Possible Fill

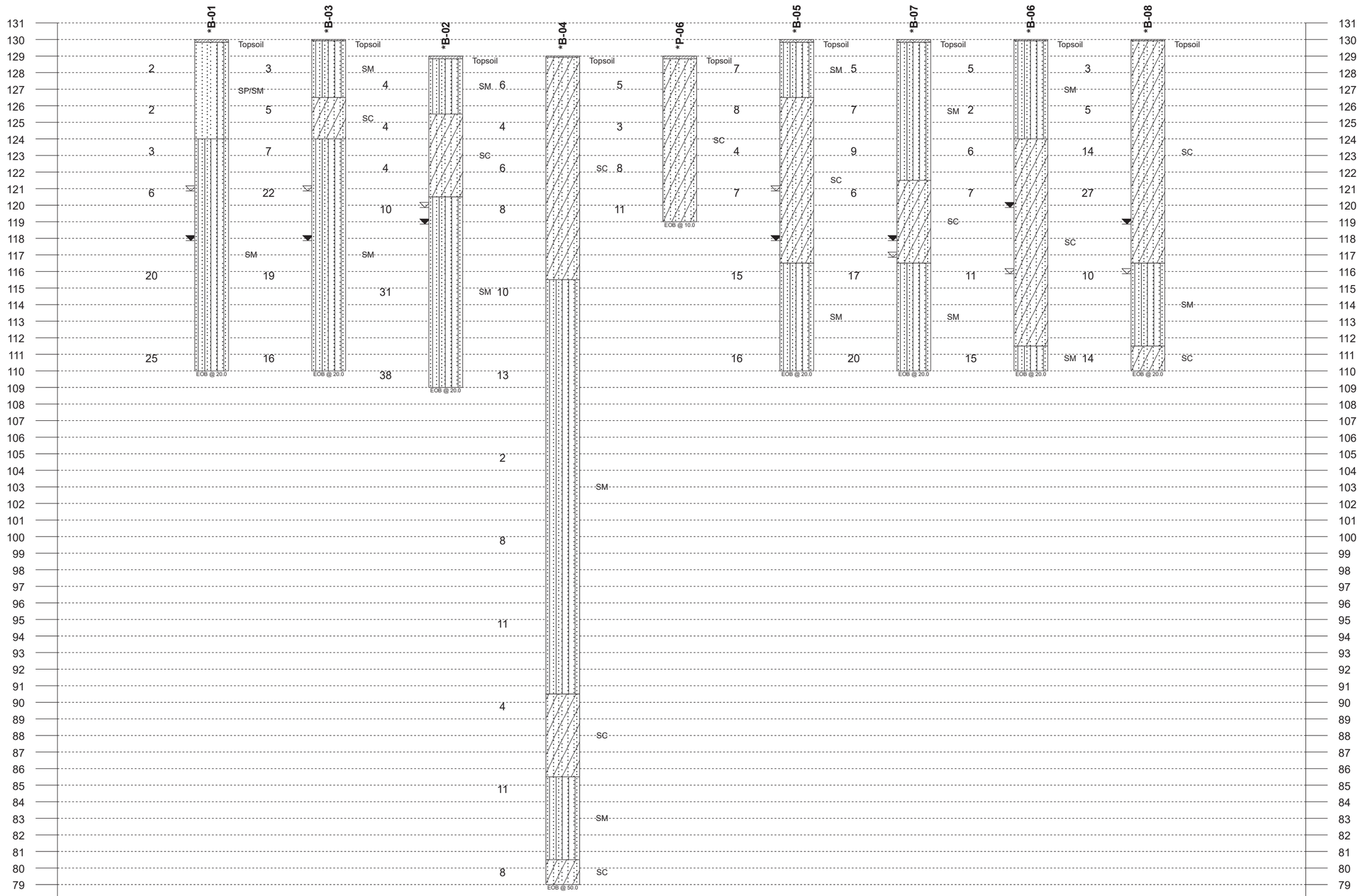
Probable Fill

Rock

GENERALIZED SUBSURFACE PROFILE A-A'

EYF Hangar Development Phase 1 and 2
WK Dickson & Co., Inc.
466 Airport Rd, Elizabethtown, North Carolina, 28337

Project No: 33:7114 Date: 12/04/2024



Legend Key

- Topsoil
- SM
- SC
- SP/SM

78.00

Notes:

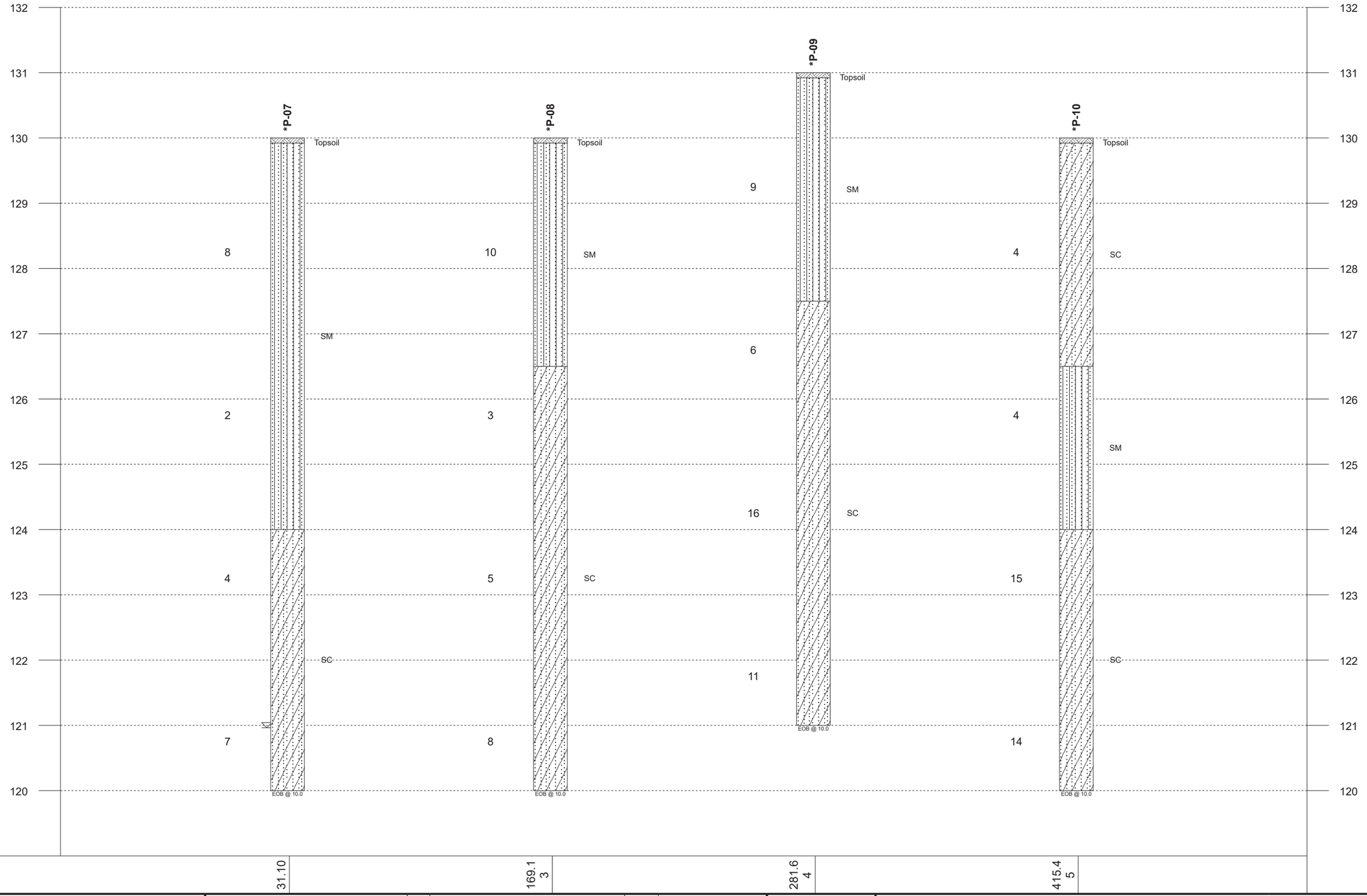
1- EOB: END OF BORING AR: AUGER REFUSAL SR: SAMPLER REFUSAL.
2- THE NUMBER BELOW THE STRIPS IS THE DISTANCE ALONG THE BASELINE.
3- SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
4- STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).

Plastic Limit Water Content Liquid Limit X—●—△	WL (First Encountered)	Fill	
[FINES CONTENT %]	WL (Completion)	Possible Fill	
BOTTOM OF CASING	WL (Seasonal High Water)	Probable Fill	
100% LOSS OF CIRCULATION	WL (Stabilized)	Rock	

GENERALIZED SUBSURFACE PROFILE B-B'

EYF Hangar Development Phase 1 and 2
WK Dickson & Co., Inc.
466 Airport Rd, Elizabethtown, North Carolina, 28337

Project No: 33:7114 Date: 12/04/2024



Legend Key

- Topsoil
- SM
- SC

119.00

Notes:

1- EOB: END OF BORING AR: AUGER REFUSAL SR: SAMPLER REFUSAL.
2- THE NUMBER BELOW THE STRIPS IS THE DISTANCE ALONG THE BASELINE.
3- SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
4- STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).

Plastic Limit Water Content Liquid Limit X—●—△	WL (First Encountered)	Fill	
[FINES CONTENT %]	WL (Completion)	Possible Fill	
BOTTOM OF CASING	WL (Seasonal High Water)	Probable Fill	
100% LOSS OF CIRCULATION	WL (Stabilized)	Rock	

GENERALIZED SUBSURFACE PROFILE C-C'

EYF Hangar Development Phase 1 and 2
WK Dickson & Co., Inc.
466 Airport Rd, Elizabethtown, North Carolina, 28337

Project No: 33:7114 Date: 12/04/2024

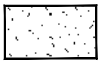
APPENDIX B – Field Operations

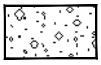
Reference Notes for Boring Logs
Subsurface Exploration Procedure: Standard Penetration Testing (SPT)
Boring Logs

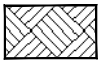
REFERENCE NOTES FOR BORING LOGS

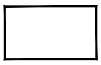
MATERIAL[1,2]

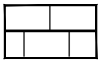

ASPHALT


CONCRETE


GRAVEL

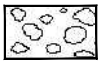

TOPSOIL

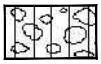

VOID


BRICK

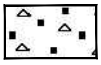

AGGREGATE BASE COURSE

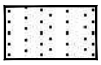

GW **WELL-GRADED GRAVEL**
gravel-sand mixtures, little or no fines

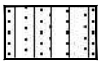

GP **POORLY-GRADED GRAVEL**
gravel-sand mixtures, little or no fines


GM **SILTY GRAVEL**
gravel-sand-silt mixtures

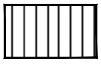

GC **CLAYEY GRAVEL**
gravel-sand-clay mixtures

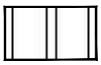

SW **WELL-GRADED SAND**
gravelly sand, little or no fines

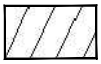

SP **POORLY-GRADED SAND**
gravelly sand, little or no fines


SM **SILTY SAND**
sand-silt mixtures

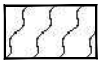

SC **CLAYEY SAND**
sand-clay mixtures

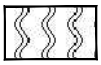

ML **SILT**
non-plastic to medium plasticity

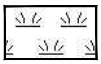

MH **ELASTIC SILT**
high plasticity


CL **LEAN CLAY**
low to medium plasticity


CH **FAT CLAY**
high plasticity


OL **ORGANIC SILT or CLAY**
non-plastic to low plasticity


OH **ORGANIC SILT or CLAY**
high plasticity


PT **PEAT**
highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS

SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION

DESIGNATION		PARTICLE SIZES
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS

UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	SPT[5] (BPF)	CONSISTENCY[7] (COHESIVE)
<0.25	<2	Very Soft
0.25 - <0.50	2 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS

SPT[5]	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective *(ex: "Silty")*	25 - 45	30 - 45

WATER LEVELS[6]

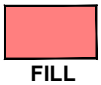

WL (First Encountered)


WL (Completion)


WL (Seasonal High Water)


WL (Stabilized)

FILL AND ROCK


FILL


POSSIBLE FILL


PROBABLE FILL


ROCK

[1]Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

[2]To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

[3]Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

[4]Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

[5]Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

[6]The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

[7]Minor deviation from ASTM D 2488-17 Note 14.

[8]Percentages are estimated to the nearest 5% per ASTM D 2488-17.

SUBSURFACE EXPLORATION PROCEDURE: STANDARD PENETRATION TESTING (SPT) ASTM D 1586 Split-Barrel Sampling

Standard Penetration Testing, or **SPT**, is the most frequently used subsurface exploration test performed worldwide. This test provides samples for identification purposes, as well as a measure of penetration resistance, or N-value. The N-Value, or blow counts, when corrected and correlated, can approximate engineering properties of soils used for geotechnical design and engineering purposes.

SPT Procedure:

- Involves driving a hollow tube (split-spoon) into the ground by dropping a 140-lb hammer a height of 30-inches at desired depth
- Recording the number of hammer blows required to drive split-spoon a distance of 18-24 inches (in 3 or 4 Increments of 6 inches each)

- Auger is advanced* and an additional SPT is performed
- One SPT typically performed for every two to five feet. An approximate 1.5 inch diameter soil sample is recovered.

**Drilling Methods May Vary*— The predominant drilling methods used for SPT are open hole fluid rotary drilling and hollow-stem auger drilling.

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-01**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.601588	**-78.576827**		**130.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					Topsoil Thickness[2.00"]	130	
	S-1	SS	18	18	(SP-SM) POORLY-GRADED SAND WITH SILT, brown to tan, moist, very loose		1-1-1 (2)
	S-2	SS	18	18			1-1-1 (2)
5						125	
	S-3	SS	18	18	(SM) SILTY SAND, brown to tan, moist to wet, very loose to medium dense		1-1-2 (3)
	S-4	SS	18	18			1-2-4 (6)
10						120	
	S-5	SS	18	18			4-9-11 (20)
15						115	
	S-6	SS	18	18			6-11-14 (25)
20					**END OF BORING AT 20.0 FT**	110	
25						105	
30						100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] %
(10 20 30 40 50)

7.0 [9.9%]

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	**9.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**13.00**
WL (Completion)	**12.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-02**	**1 of 1**

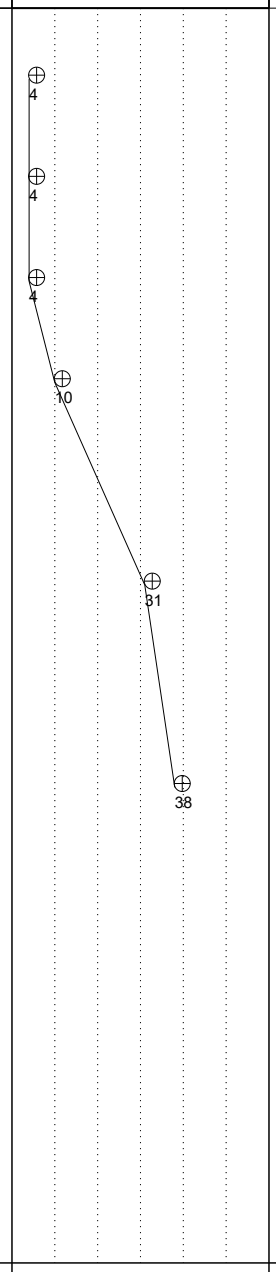
PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

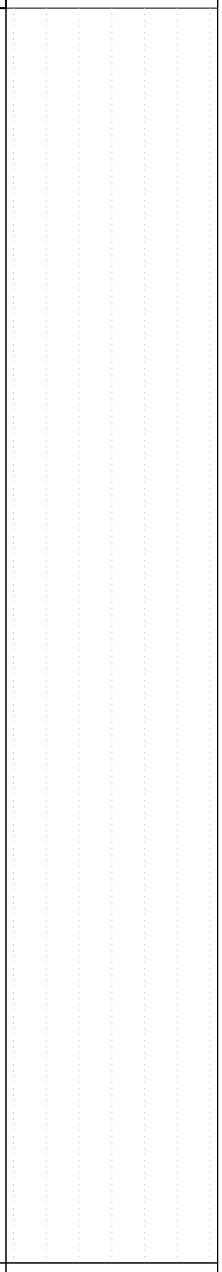
SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.601251	**-78.576536**		**129.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, loose			2-2-2 (4)
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish brown, moist, loose			2-2-2 (4)
5							124	
	S-3	SS	18	18				2-2-2 (4)
	S-4	SS	18	18	(SM) SILTY SAND, brown/ tan, moist, loose to dense	▽ ▼		4-4-6 (10)
10							119	
	S-5	SS	18	18				8-14-17 (31)
15							114	
	S-6	SS	18	18				8-18-20 (38)
20					**END OF BORING AT 20.0 FT**		109	
25							104	
30							99	





THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

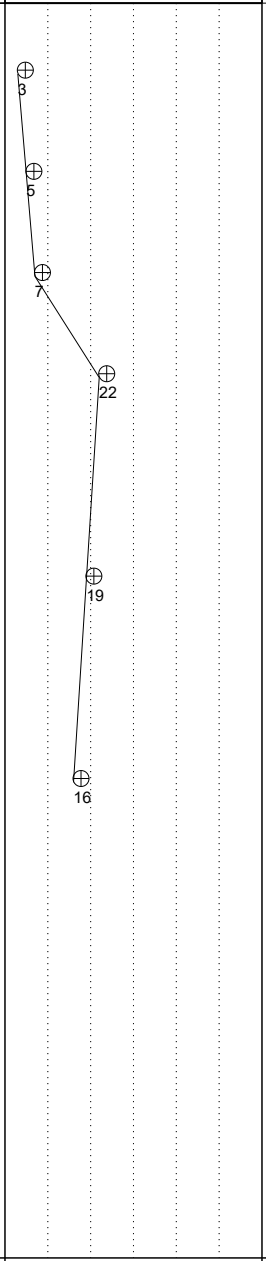
▽ WL (First Encountered)	**9.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**12.70**
▼ WL (Completion)	**10.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
▽ WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
▽ WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-03**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.601512	**-78.576946**		**130.0**

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, very loose			2-2-1 (3)
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish brown, moist, loose		125	1-2-3 (5)
5	S-3	SS	18	18	(SM) SILTY SAND, tan/ brown, moist, loose to medium dense			1-3-4 (7)
	S-4	SS	18	18		▽		5-9-13 (22)
10						▼	120	
	S-5	SS	18	18				4-7-12 (19)
15							115	
	S-6	SS	18	18				4-7-9 (16)
20					**END OF BORING AT 20.0 FT**		110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50; 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT



LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	**9.00**	BORING STARTED:	**Nov 01 2024**	CAVE IN DEPTH:	**13.00**
▼ WL (Completion)	**12.00**	BORING COMPLETED:	**Nov 01 2024**	HAMMER TYPE:	**Auto**
▽ WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
▽ WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-04**	**1 of 2**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.601176	**-78.576660**		**129.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SC) CLAYEY SAND, tan to brown, moist, very loose to loose			2-3-3 (6)
	S-2	SS	18	18				1-2-2 (4)
5	S-3	SS	18	18			124	2-2-4 (6)
	S-4	SS	18	18				2-4-4 (8)
10							119	
	S-5	SS	18	18	(SM) SILTY SAND, tan/ orange/ brown, moist to wet, very loose to medium dense			3-4-6 (10)
15							114	
	S-6	SS	18	18				5-6-7 (13)
20							109	
	S-7	SS	18	18				2-1-1 (2)
25							104	
	S-8	SS	18	18				3-3-5 (8)
30							99	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50; 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

11.8 [22.2%]

CONT'D ON NEXT PAGE

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	BORING STARTED: **Nov 01 2024**		CAVE IN DEPTH: **22.00**
WL (Completion) **DRY**	BORING COMPLETED: **Nov 01 2024**		HAMMER TYPE: **Auto**
WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-04**	**2 of 2**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.601176	**-78.576660**		**129.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
35	S-9	SS	18	18	(SM) SILTY SAND, tan/ orange/ brown, moist to wet, very loose to medium dense		94	2-4-7 (11)
40	S-10	SS	18	18	(SC) CLAYEY SAND, tan, wet, loose		89	2-1-3 (4)
45	S-11	SS	18	18	(SM) SILTY SAND, orangish tan, moist, medium dense		84	5-7-4 (11)
50	S-12	SS	18	18	(SC) CLAYEY SAND, dark gray, wet, loose		79	3-4-4 (8)
					END OF BORING AT 50.0 FT			
55							74	
60							69	

STANDARD PENETRATION BLOWS/FT: 10 20 30 40 50
ROCK QUALITY DESIGNATION & RECOVERY: 20 40 60 80 100
RQD
REC
MC SAMPLER BLOWS/FT: 10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF: 1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %: 10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Nov 01 2024**	CAVE IN DEPTH: **22.00**	
▼ WL (Completion) **DRY**	BORING COMPLETED: **Nov 01 2024**	HAMMER TYPE: **Auto**	
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-05**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.601025	**-78.576340**		**130.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, loose			3-3-4 (7)
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish brown, moist, very loose to loose			3-3-5 (8)
5							125	
	S-3	SS	18	18				2-2-2 (4)
	S-4	SS	18	18				2-3-4 (7)
10							120	
	S-5	SS	18	18	(SM) SILTY SAND, brown/ tan, moist, medium dense			3-6-9 (15)
15							115	
	S-6	SS	18	18				3-5-11 (16)
20					**END OF BORING AT 20.0 FT**		110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	**9.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**12.00**
WL (Completion)	**12.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

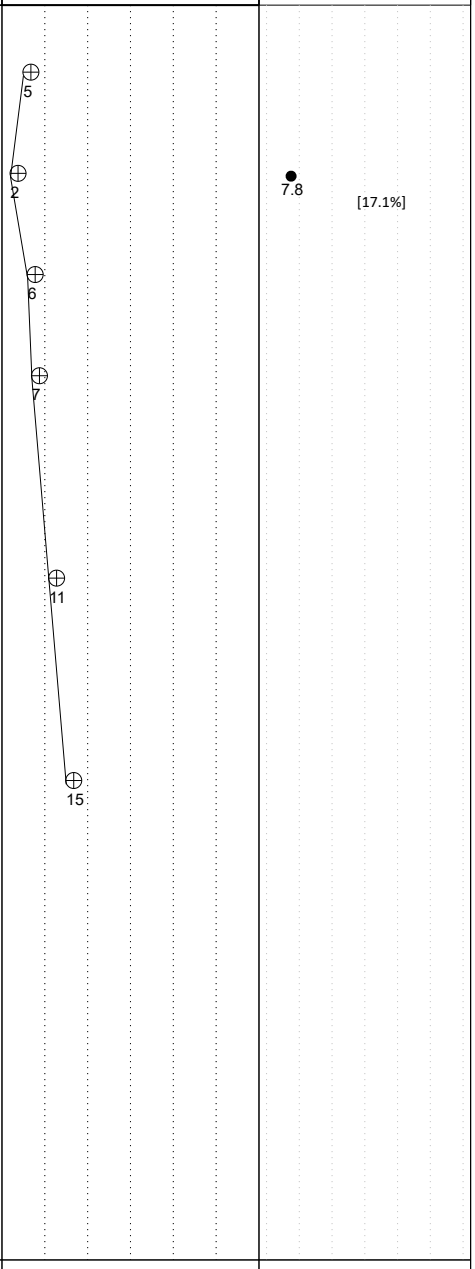
CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-06**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.600707	**-78.576062**		**130.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, tan/ brown, moist, loose to very loose			2-3-2 (5)
	S-2	SS	18	18				1-1-1 (2)
5							125	
	S-3	SS	18	18	(SC) CLAYEY SAND, brown/ tan, moist, loose to medium dense			2-2-4 (6)
	S-4	SS	18	18		▼		2-4-3 (7)
10							120	
	S-5	SS	18	18		⧖		3-4-7 (11)
15							115	
	S-6	SS	18	18	(SM) SILTY SAND, orangish brown, moist, medium dense			4-7-8 (15)
20					**END OF BORING AT 20.0 FT**		110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

⧖ WL (First Encountered)	**14.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**11.30**
▼ WL (Completion)	**10.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
⧩ WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
⧖ WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

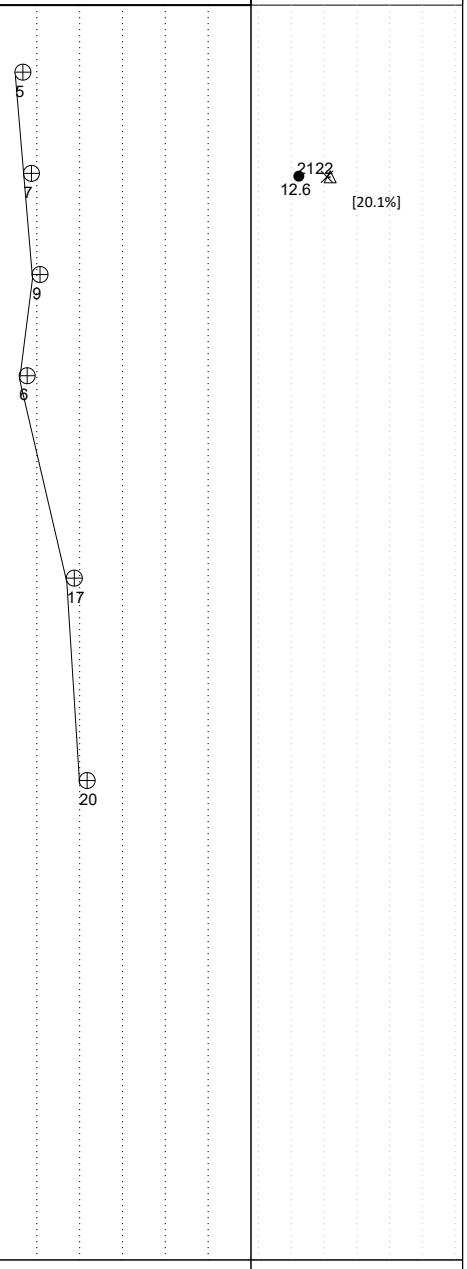
CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-07**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.600967	**-78.576432**		**130.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					Topsoil Thickness[2.00"]		130	
	S-1	SS	18	18	(SM) SILTY SAND, tan, moist, loose			2-2-3 (5)
	S-2	SS	18	18				2-3-4 (7)
5	S-3	SS	18	18			125	3-4-5 (9)
	S-4	SS	18	18	(SC) CLAYEY SAND, orangish tan, moist, loose	▼		2-2-4 (6)
10							120	
	S-5	SS	18	18	(SM) SILTY SAND, tan, moist, medium dense			3-8-9 (17)
15							115	
	S-6	SS	18	18				4-8-12 (20)
20					**END OF BORING AT 20.0 FT**		110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT: 10 20 30 40 50
ROCK QUALITY DESIGNATION & RECOVERY: 20 40 60 80 100
RQD
REC
MC SAMPLER BLOWS/FT: 10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF: 1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %: 10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

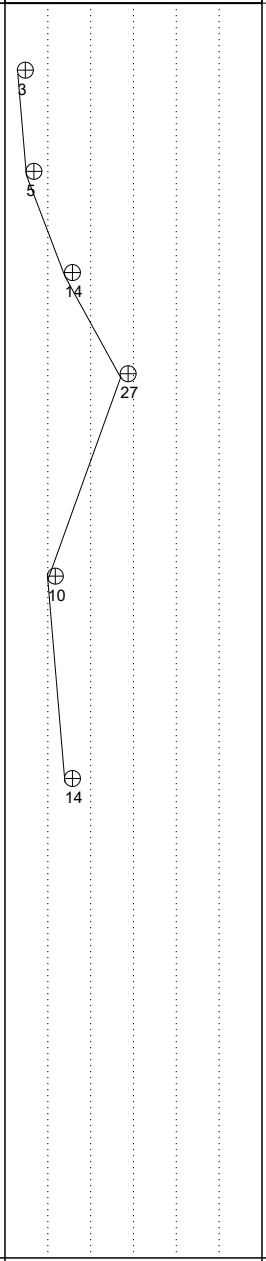
▽ WL (First Encountered)	**13.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**13.00**
▼ WL (Completion)	**12.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
▽ WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
▽ WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**B-08**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.600650	**-78.576161**		**130.0**

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]		
	S-1	SS	18	18	(SC) CLAYEY SAND, orangish tan/ gray, moist, very loose to medium dense		2-2-1 (3)
	S-2	SS	18	18			1-2-3 (5)
5	S-3	SS	18	18		125	4-5-9 (14)
	S-4	SS	18	18			9-13-14 (27)
10						120	
	S-5	SS	18	18	(SM) SILTY SAND, brown, moist, loose		2-3-7 (10)
15						115	
	S-6	SS	18	18	(SC) CLAYEY SAND, grayish brown, moist, medium dense		4-6-8 (14)
20					**END OF BORING AT 20.0 FT**	110	
25						105	
30						100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT



LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	**14.00**	BORING STARTED:	**Oct 31 2024**	CAVE IN DEPTH:	**12.00**
WL (Completion)	**11.00**	BORING COMPLETED:	**Oct 31 2024**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)		EQUIPMENT:	LOGGED BY:	DRILLING METHOD:	**Hollow Stem Auger**
WL (Stabilized)		**CME 75**	**DTH4**		

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**C-01**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.604789	**-78.579444**		**132.0**

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					ASPHALT[2.00"]		132	
					ABC STONE[4.00"]			
					END OF BORING AT 1.0 FT			
5							127	
10							122	
15							117	
20							112	
25							107	
30							102	

STANDARD PENETRATION BLOWS/FT: 10 20 30 40 50 | 20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT: 10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF: 1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %: 10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Nov 01 2024**		CAVE IN DEPTH:
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**		HAMMER TYPE: **Auto**
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**C-02**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.601447	**-78.577264**		**130.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					ASPHALT[3.00"]		130	
					ABC STONE[3.00"]			
					END OF BORING AT 1.0 FT			
5							125	
10							120	
15							115	
20							110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Nov 01 2024**		CAVE IN DEPTH:
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**		HAMMER TYPE: **Auto**
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-01**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

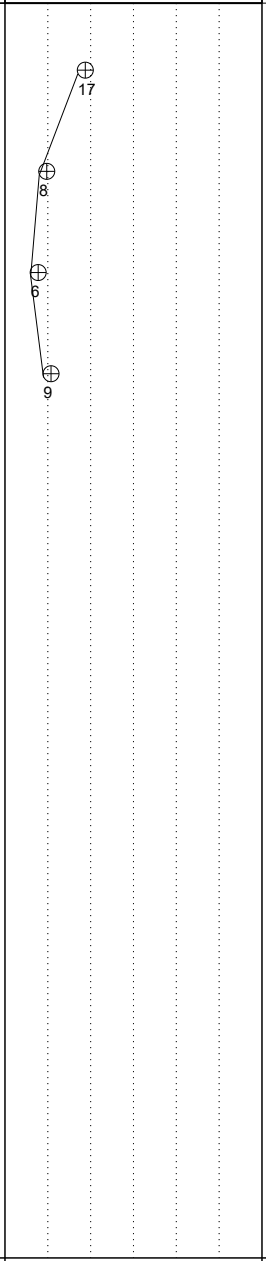
SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.604513	**-78.579216**		**129.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, medium dense			4-8-9 (17)
5	S-2	SS	18	18	(SC) CLAYEY SAND, orangish tan, moist, loose		124	2-4-4 (8)
	S-3	SS	18	18				2-3-3 (6)
10	S-4	SS	18	18	(SM) SILTY SAND, red and orange, moist, loose	▽	119	3-4-5 (9)
					END OF BORING AT 10.0 FT			
15							114	
20							109	
25							104	
30							99	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT



LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered) **9.00**	BORING STARTED: **Nov 01 2024**	CAVE IN DEPTH: **6.00**	
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**	HAMMER TYPE: **Auto**	
▽ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-02**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.603959	**-78.578741**		**127.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, tan, moist, loose			2-2-3 (5)
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish tan, moist to wet, loose to medium dense			2-2-4 (6)
5							122	
	S-3	SS	18	18				2-3-4 (7)
	S-4	SS	18	18		▽		3-8-14 (22)
10					**END OF BORING AT 10.0 FT**		117	
15							112	
20							107	
25							102	
30							97	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered) **9.00**	BORING STARTED: **Nov 01 2024**		CAVE IN DEPTH: **8.80**
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**		HAMMER TYPE: **Auto**
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-03**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

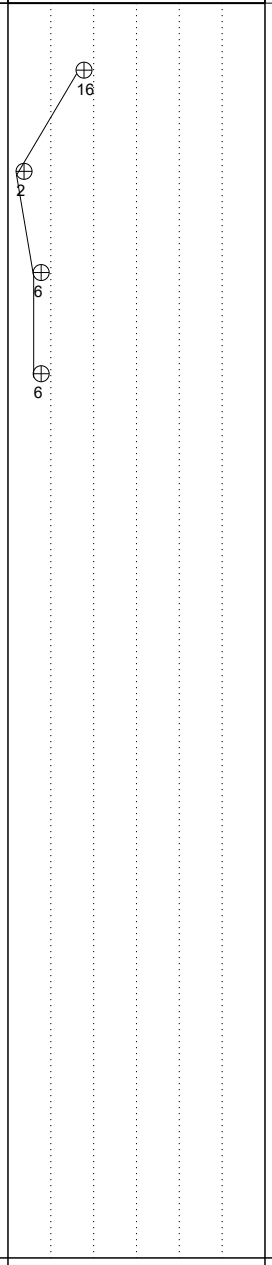
LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.603423	**-78.578284**		**128.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					Topsoil Thickness[2.00"]			
	S-1	SS	18	18	(SC) CLAYEY SAND, orangish tan/ brown, moist to saturated, medium dense to very loose			4-7-9 (16)
	S-2	SS	18	18				1-1-1 (2)
5	S-3	SS	18	18			123	1-2-4 (6)
	S-4	SS	18	18		▽		2-3-3 (6)
10					**END OF BORING AT 10.0 FT**		118	
15							113	
20							108	
25							103	
30							98	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered) **9.00**	BORING STARTED: **Nov 01 2024**	CAVE IN DEPTH: **8.70**	
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**	HAMMER TYPE: **Auto**	
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

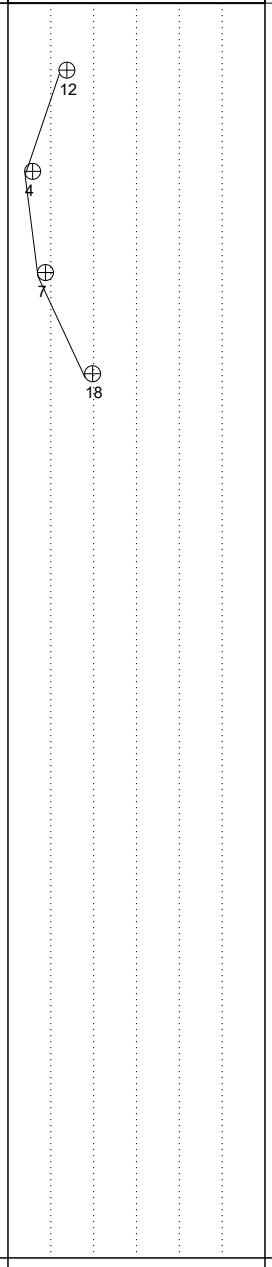
CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-04**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.602811	**-78.577761**		**128.0**

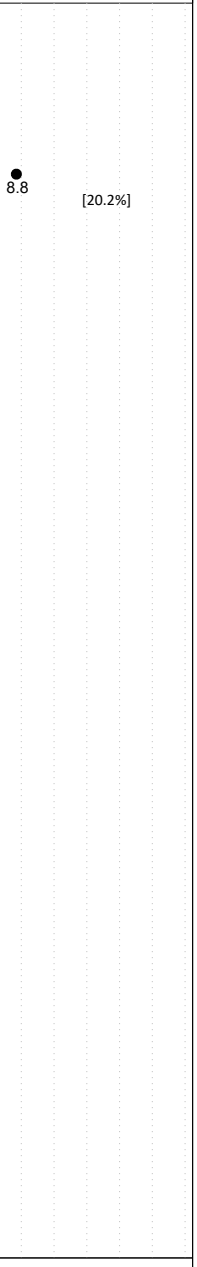
BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, medium dense to very loose			4-6-6 (12)
	S-2	SS	18	18				2-2-2 (4)
5							123	
	S-3	SS	18	18	(SC) CLAYEY SAND, grayish brown, moist, loose to medium dense			2-3-4 (7)
	S-4	SS	18	18		▽		3-8-10 (18)
10					**END OF BORING AT 10.0 FT**		118	
15							113	
20							108	
25							103	
30							98	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50





THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered) **9.00**	BORING STARTED: **Nov 01 2024**	CAVE IN DEPTH: **8.00**	
▼ WL (Completion)	BORING COMPLETED: **Nov 01 2024**	HAMMER TYPE: **Auto**	
▽ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-05**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.602150	**-78.577175**		**131.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					Topsoil Thickness[2.00"]		
	S-1	SS	18	18	(SC) CLAYEY SAND, brown, moist, very loose		1-2-2 (4)
	S-2	SS	18	18	(SM) SILTY SAND, brown, moist, very loose		1-1-3 (4)
5						126	
	S-3	SS	18	18	(SC) CLAYEY SAND, gray, moist, very loose to medium dense		1-2-1 (3)
	S-4	SS	18	18			4-6-8 (14)
10					**END OF BORING AT 10.0 FT**	121	
15						116	
20						111	
25						106	
30						101	

WATER LEVELS

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	BORING STARTED: **Nov 01 2024**	CAVE IN DEPTH: **8.30**	
WL (Completion) **DRY**	BORING COMPLETED: **Nov 01 2024**	HAMMER TYPE: **Auto**	
WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-06**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.601142	**-78.576448**		**129.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SC) CLAYEY SAND, tan, moist, very loose to medium dense			2-3-2 (5)
	S-2	SS	18	18				1-1-2 (3)
5	S-3	SS	18	18			124	3-3-5 (8)
	S-4	SS	18	18				4-5-6 (11)
10					**END OF BORING AT 10.0 FT**		119	
15							114	
20							109	
25							104	
30							99	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	BORING STARTED: **Oct 31 2024**	CAVE IN DEPTH: **8.00**	
WL (Completion) **DRY**	BORING COMPLETED: **Oct 31 2024**	HAMMER TYPE: **Auto**	
WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-07**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**		
SITE LOCATION:			LOSS OF CIRCULATION
466 Airport Rd, Elizabethtown, North Carolina, 28337			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
34.601414	**-78.577091**		**130.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
0					Topsoil Thickness[1.00"]		130	
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, loose to very loose			4-4-4 (8)
	S-2	SS	18	18				WOH-1-1 (2)
5							125	
	S-3	SS	18	18	(SC) CLAYEY SAND, grayish brown, moist, very loose to loose	▽		1-2-2 (4)
	S-4	SS	18	18				1-2-5 (7)
10					**END OF BORING AT 10.0 FT**		120	
15							115	
20							110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered) **9.00**	BORING STARTED: **Oct 30 2024**	CAVE IN DEPTH: **8.60**	
▼ WL (Completion)	BORING COMPLETED: **Oct 30 2024**	HAMMER TYPE: **Auto**	
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-08**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.601108	**-78.576820**		**130.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, brown, moist, loose			3-6-4 (10)
5	S-2	SS	18	18	(SC) CLAYEY SAND, tan, moist, very loose to loose		125	1-1-2 (3)
	S-3	SS	18	18				1-2-3 (5)
10	S-4	SS	18	18	**END OF BORING AT 10.0 FT**		120	2-3-5 (8)
15							115	
20							110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

WL (First Encountered)	BORING STARTED: **Oct 30 2024**	CAVE IN DEPTH: **8.30**	
WL (Completion) **DRY**	BORING COMPLETED: **Oct 30 2024**	HAMMER TYPE: **Auto**	
WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-09**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

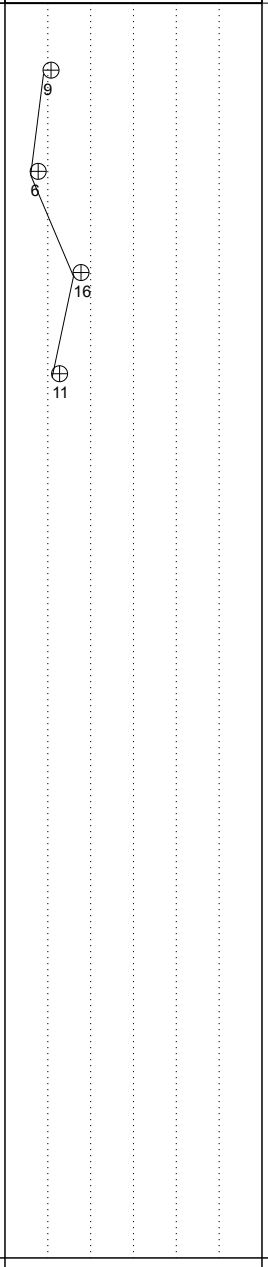
LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.600858	**-78.576600**		**131.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, tan, moist, loose			3-5-4 (9)
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish brown/ tan, moist, loose to medium dense			2-2-4 (6)
5	S-3	SS	18	18			126	3-7-9 (16)
	S-4	SS	18	18				4-4-7 (11)
10					**END OF BORING AT 10.0 FT**		121	
15							116	
20							111	
25							106	
30							101	

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50
20 40 60 80 100
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT
10 20 30 40 50
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF
1 2 3 4 5
WATER CONTENT %
[FINES CONTENT] %
10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Oct 30 2024**		CAVE IN DEPTH: **9.00**
▼ WL (Completion) **DRY**	BORING COMPLETED: **Oct 30 2024**		HAMMER TYPE: **Auto**
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
WK Dickson & Co., Inc.	**33:7114**	**P-10**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
EYF Hangar Development Phase 1 and 2	**J And L Drilling Inc**

SITE LOCATION: **466 Airport Rd, Elizabethtown, North Carolina, 28337**

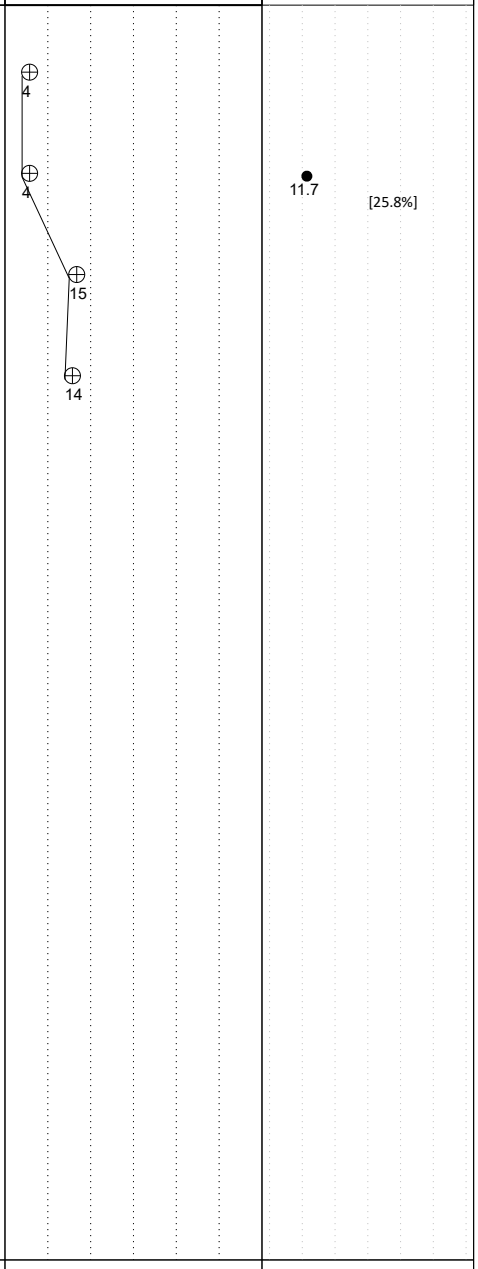
LOSS OF CIRCULATION

LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:	BOTTOM OF CASING
34.600567	**-78.576337**		**130.0**	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (TCP/MC/SPT-N value)*
					Topsoil Thickness[1.00"]			
	S-1	SS	18	18	(SC) CLAYEY SAND, orangish tan, moist, very loose			3-2-2 (4)
5	S-2	SS	18	18	(SM) SILTY SAND, orangish tan, moist, very loose		125	1-2-2 (4)
	S-3	SS	18	18	(SC) CLAYEY SAND, orangish tan, moist, medium dense			3-7-8 (15)
10	S-4	SS	18	18	**END OF BORING AT 10.0 FT**		120	5-6-8 (14)
15							115	
20							110	
25							105	
30							100	

STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 / 20 40 60 80 100)
ROCK QUALITY DESIGNATION & RECOVERY
RQD
REC
MC SAMPLER BLOWS/FT (10 20 30 40 50)
TEXAS CONE PENETRATION BLOWS/FT

LIQUID LIMIT
PLASTIC LIMIT
CALIBRATED PENETROMETER TSF (1 2 3 4 5)
WATER CONTENT %
[FINES CONTENT] % (10 20 30 40 50)



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Oct 30 2024**	CAVE IN DEPTH: **8.80**	
▼ WL (Completion) **DRY**	BORING COMPLETED: **Oct 30 2024**	HAMMER TYPE: **Auto**	
▼ WL (Seasonal High Water)	EQUIPMENT: **CME 75**	LOGGED BY: **DTH4**	DRILLING METHOD: **Hollow Stem Auger**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary
Plasticity Charts
Moisture-Density Relationship Curves
CBR Test Results

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-01	S-2	3.5-5.0	7.0	SP-SM	NP	NP	NP	9.9					
B-04	S-3	6.0-7.5	11.8	SC	26	18	8	22.2					
B-06	S-2	3.5-5.0	7.8	SM	NP	NP	NP	17.1					
B-07	S-2	3.5-5.0	12.6	SM	22	21	1	20.1					
P-04	S-2	3.5-5.0	8.8	SM	NP	NP	NP	20.2					
P-10	S-2	3.5-5.0	11.7	SM	NP	NP	NP	25.8					

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: EYF Hangar Development Phase 1 and 2
Client:

Project No.: 33:7114
Date Reported: 11/20/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received
acreech	acreech	acreech	11/11/2024

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
P-03A	D3S-1	1.0-5.0	8.9	*SP-SM	NP	NP	NP	10.8	118.6	8.5	21.3	20.6	
P-08A	D3S-2	1.0-5.0	5.8	*SP-SM	NP	NP	NP	11.9	115.9	7.6	19	18.7	

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

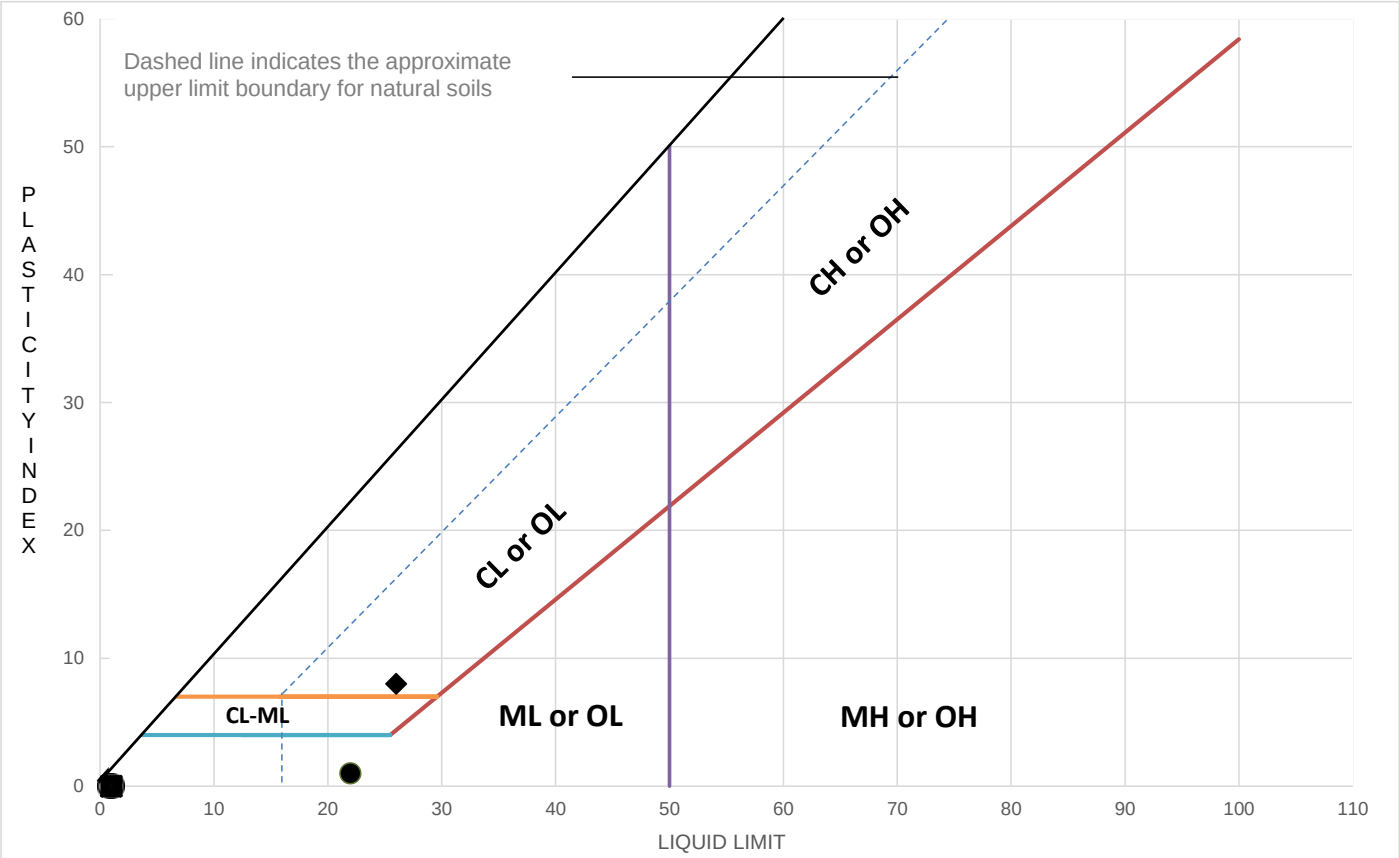
Project: EYF Hangar Development Phase 1 and 2
Client:

Project No.: 33:7114
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received
acreech	acreech	acreech	11/11/2024

LIQUID AND PLASTIC LIMITS TEST REPORT



TEST RESULTS (ASTM D4318-10 (MULTIPOINT TEST))

	Sample Location	Sample Number	Sample Depth (ft)	LL	PL	PI	%<#40	%<#200	AASHTO	USCS	Material Description
■	B-01	S-2	3.50-5.00	NP	NP	NP		9.9			(SP-SM) POORLY GRADED SAND WITH SILT, Light
◆	B-04	S-3	6.00-7.50	26	18	8		22.2			(SC) CLAYEY SAND, Yellowish Red
▲	B-06	S-2	3.50-5.00	NP	NP	NP		17.1			(SM) SILTY SAND, Yellowish Brown
●	B-07	S-2	3.50-5.00	22	21	1		20.1			(SM) SILTY SAND, Yellowish Brown
✳	P-04	S-2	3.50-5.00	NP	NP	NP		20.2			(SM) SILTY SAND, Light Brown
⊗	P-10	S-2	3.50-5.00	NP	NP	NP		25.8			(SM) SILTY SAND, Reddish Brown

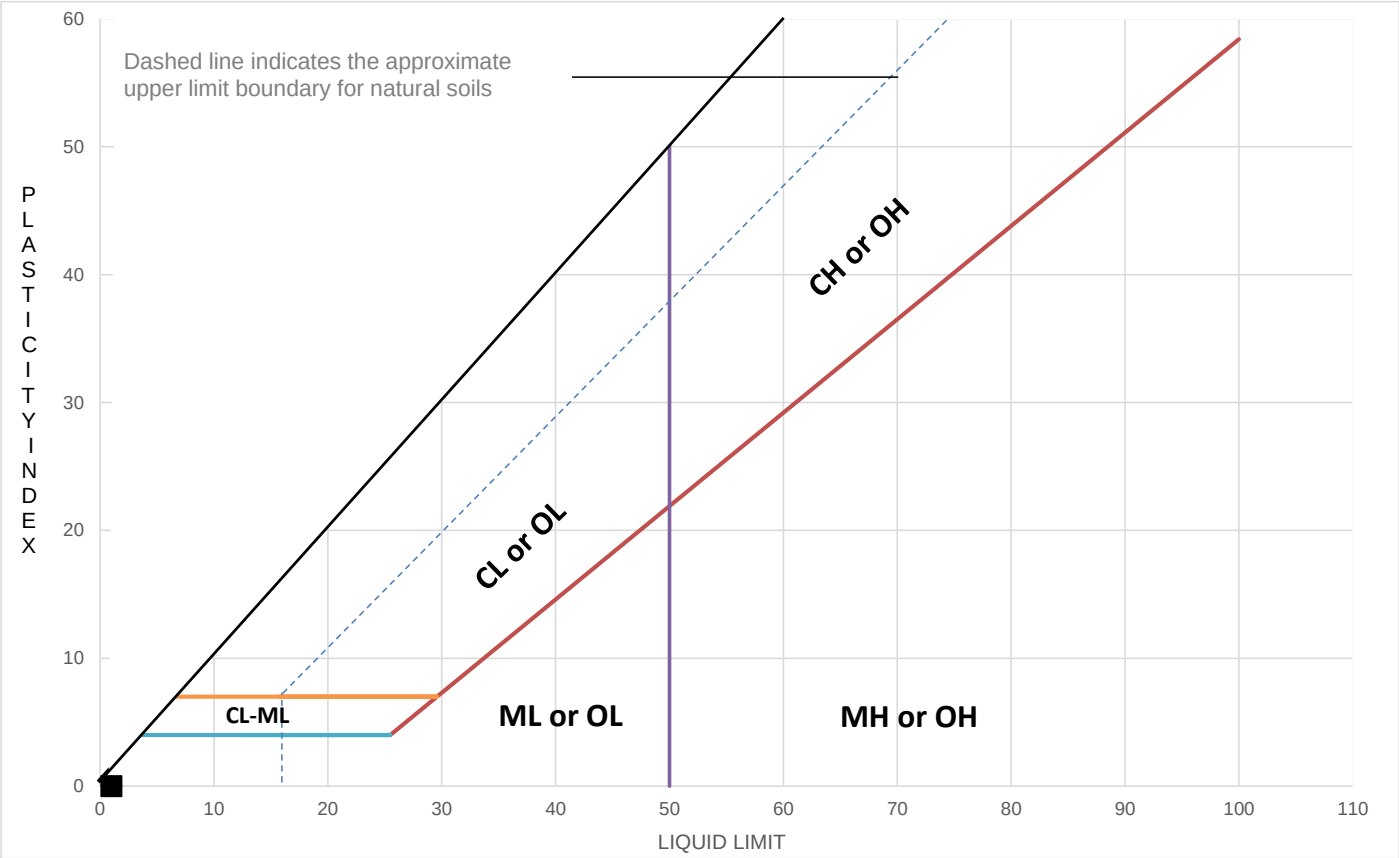
Project: EYF Hangar Development Phase 1 and 2
Client:

Project No.: 33:7114
Date Reported: 11/20/2024

Office / Lab: ECS Southeast LLC - Raleigh
Address: 5260 Greens Dairy Road, Raleigh, NC 27616
Office Number / Fax: (919)861-9910, (919)861-9911

Tested by	Checked by	Approved by	Date Received
acreech	acreech	acreech	11/11/2024

LIQUID AND PLASTIC LIMITS TEST REPORT



TEST RESULTS (ASTM D4318-10 (MULTIPOINT TEST))

	Sample Location	Sample Number	Sample Depth (ft)	LL	PL	PI	%<#40	%<#200	AASHTO	USCS	Material Description
■	P-03A	D3S-1	1.00-5.00	NP	NP	NP		10.8			(SP-SM) POORLY GRADED SAND WITH SILT, Brown
◆	P-08A	D3S-2	1.00-5.00	NP	NP	NP		11.9			(SP-SM) POORLY GRADED SAND WITH SILT, Brown

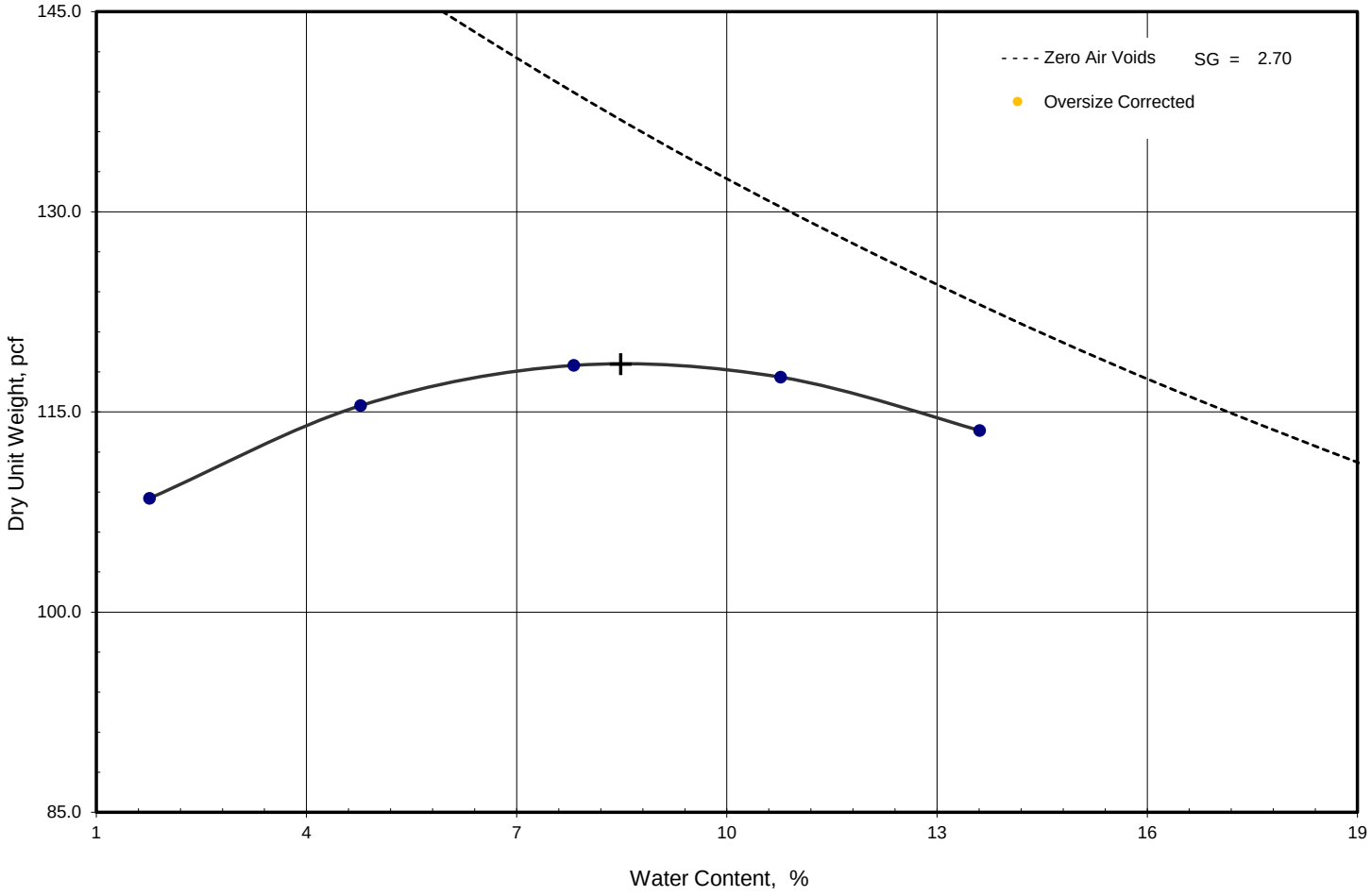
Project: EYF Hangar Development Phase 1 and 2
Client:

Project No.: 33:7114
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received
acreech	acreech	acreech	11/11/2024

Laboratory Compaction Characteristics of Soil
Using Modified Effort



Optimum Moisture Content		**8.5**	%
Maximum Dry Unit Weight		**118.6**	pcf
Cumulative material retained on:	3/4 in. sieve	0.0	%
	3/8 in. sieve	0.2	%
	#4 sieve	0.2	%

Preparation	ASTM dry preparation method	
Type of rammer	Mechanical - circular face	
Test Specfication / Method	ASTM D1557-12e1-method A	
Specific gravity - D854 water pycnometer	2.70	Historical
Coarse Aggregate Specific Gravity -	2.70	

Soil Description	Nat. Moist. %	Liquid Limit	Plasticity Index	%< #200	USCS	AASHTO
(SP-SM) POORLY GRADED SAND WITH SILT, Brown	8.9	NP	NP	10.8		

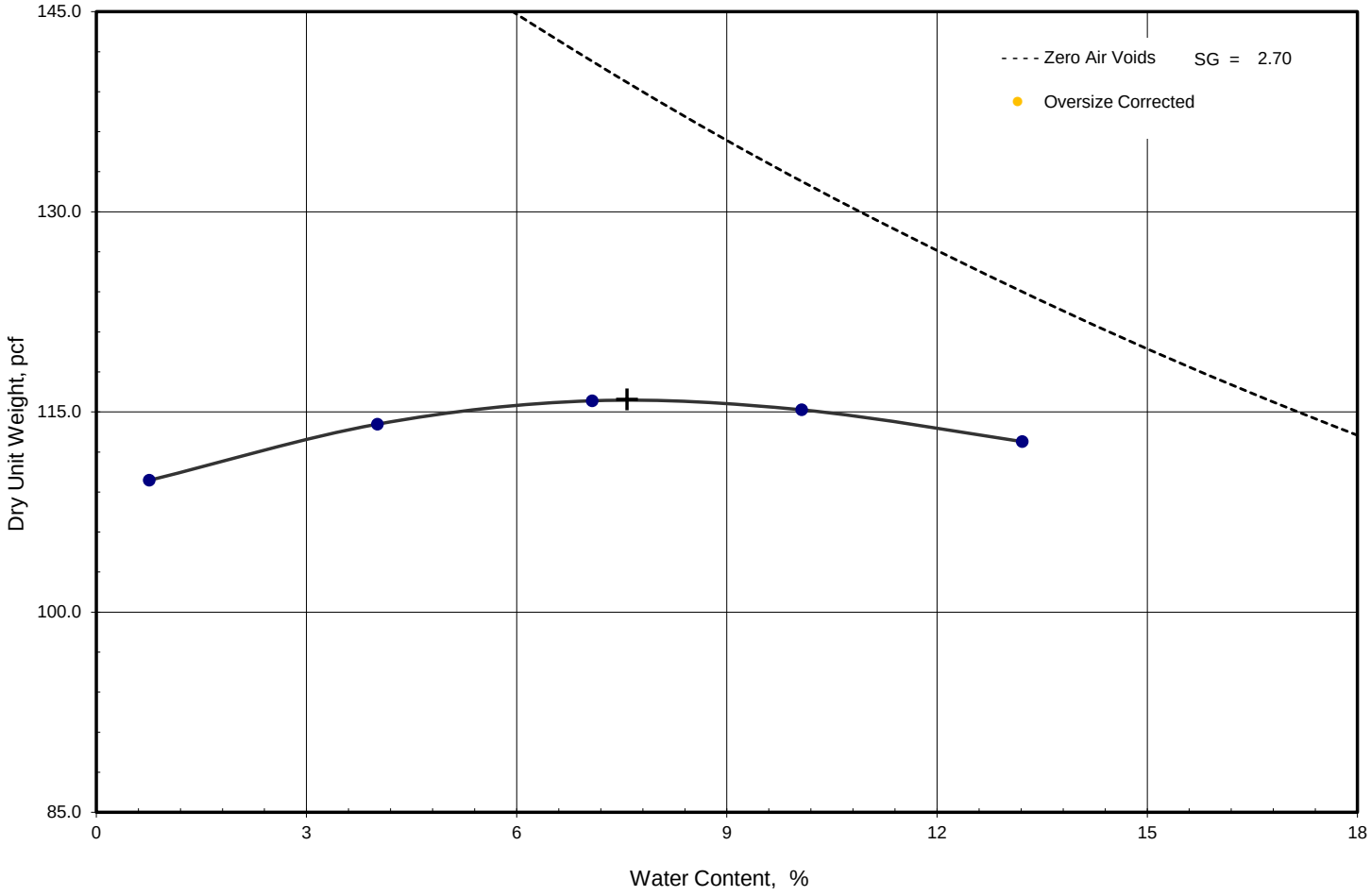
Project: EYF Hangar Development Phase 1 and 2
Client:
Sample / Source: P-03A
Test Reference/No.: 1

Project No.: 33:7114
Depth (ft.): 1 - 5
Sample No.: D3S-1
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech	11/11/2024	

Laboratory Compaction Characteristics of Soil
Using Modified Effort



Optimum Moisture Content		**7.6**	%
Maximum Dry Unit Weight		**115.9**	pcf
Cumulative material retained on:	3/4 in. sieve	0.0	%
	3/8 in. sieve	0.0	%
	#4 sieve	0.0	%

Preparation	ASTM dry preparation method	
Type of rammer	Mechanical - circular face	
Test Specfication / Method	ASTM D1557-12e1-method A	
Specific gravity - D854 water pycnometer	2.70	Historical
Coarse Aggregate Specific Gravity -	2.70	

Soil Description	Nat. Moist. %	Liquid Limit	Plasticity Index	%< #200	USCS	AASHTO
(SP-SM) POORLY GRADED SAND WITH SILT, Brown	5.8	NP	NP	11.9		

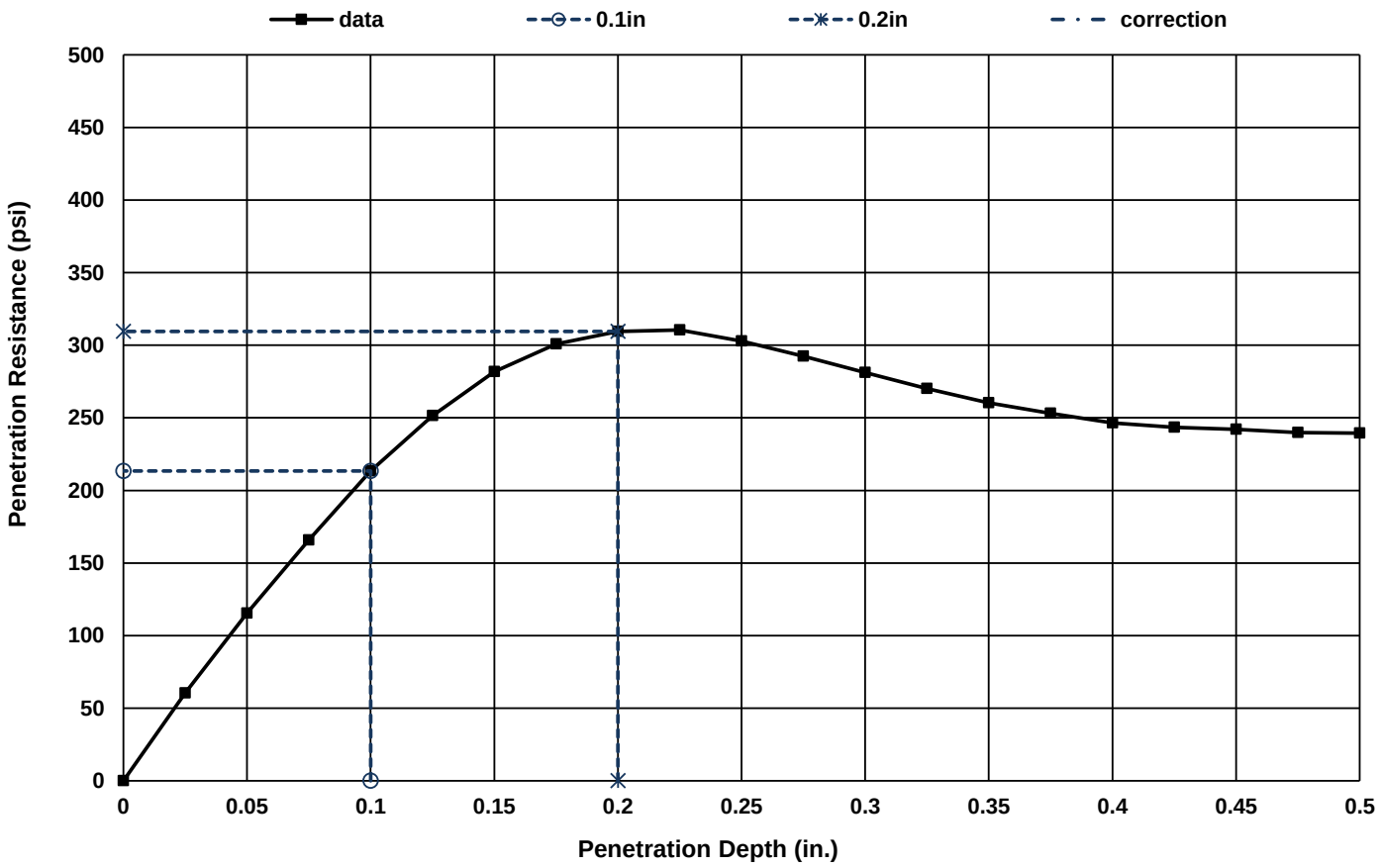
Project: EYF Hangar Development Phase 1 and 2
Client:
Sample / Source: P-08A
Test Reference/No.: 1

Project No.: 33:7114
Depth (ft.): 1 - 5
Sample No.: D3S-2
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech	11/11/2024	

California Bearing Ratios (CBR) of Laboratory-Compacted Soils



TEST RESULTS (ASTM D1883-16)

Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)		Swell (%)	
Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.1 in.	0.2 in.					
116.6	98.3	8.5	111.5	94.0	13.4	21.3	20.6	0.00	10		0.00	
Material Description					AASHTO	USCS	MAX. Dens. (pcf)	Optimum Moisture (%)	LL	PI	% Fines	% Gravel
(SP-SM) POORLY GRADED SAND WITH SILT, Brown							118.6	8.5	NP	NP		

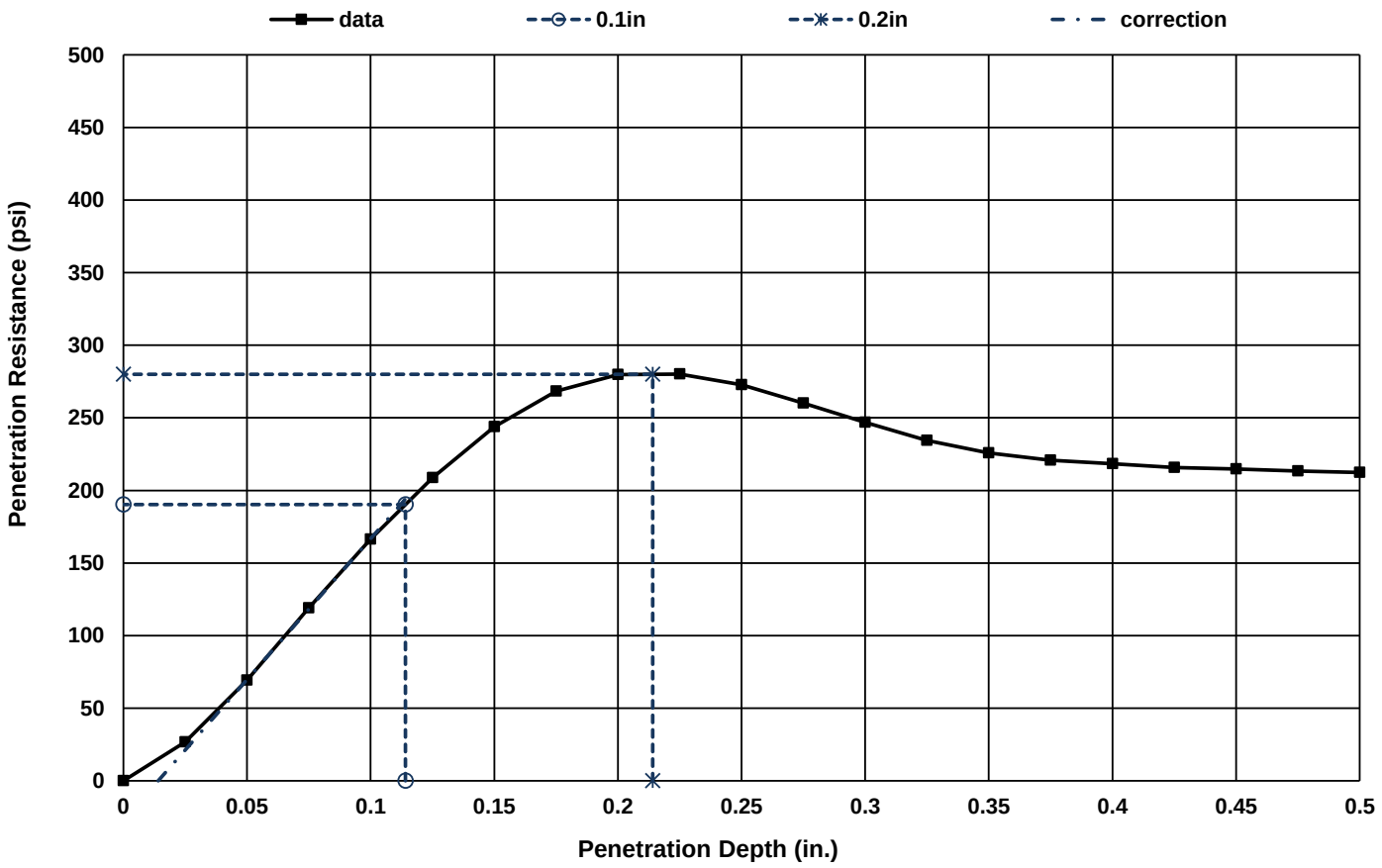
Project: EYF Hangar Development Phase 1 and 2
Client:
Sample / Source P-03A
Test Reference/No.: 1

Project No.: 33:7114
Depth (ft.): 1 - 5
Sample No.: D3S-1
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech	11/11/2024	

California Bearing Ratios (CBR) of Laboratory-Compacted Soils



TEST RESULTS (ASTM D1883-16)

Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Swell (%)
Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.1 in.	0.2 in.			
113.4	97.8	7.6	107.9	93.1	13.1	19.0	18.7	0.01	10	0.00

Material Description	AASHTO	USCS	MAX. Dens. (pcf)	Optimum Moisture (%)	LL	PI	% Fines	% Gravel
(SP-SM) POORLY GRADED SAND WITH SILT, Brown			115.9	7.6	NP	NP		

Project: EYF Hangar Development Phase 1 and 2
Client:
Sample / Source P-08A
Test Reference/No.: 1

Project No.: 33:7114
Depth (ft.): 1 - 5
Sample No.: D3S-2
Date Reported: 11/21/2024

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Raleigh	5260 Greens Dairy Road Raleigh, NC 27616	(919)861-9910 (919)861-9911

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech	11/11/2024	

Geotechnical Engineering Report for Elizabethtown Runway Pavement Rehab

ECS Southeast, LLP

Geotechnical Engineering Report

Elizabethtown Runway Pavement Rehab

466 Airport Road
Elizabethtown, North Carolina

ECS Project No. 33:5931

August 3, 2022

August 3, 2022

Mr. Jason Kennedy, P.E.
W.K. Dickson & Co., Inc
720 Corporate Center Drive
Raleigh, NC 27607

ECS Project No. 33:5931

Reference: Geotechnical Engineering Report
Elizabethtown Runway Pavement Rehab
466 Airport Road
Elizabethtown, Bladen County, North Carolina

Dear Mr. Kennedy:

ECS Southeast, LLP (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to W.K. Dickson & Co., Inc during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify subsurface conditions assumed for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Southeast, LLP

Coleman R. McDaniel, E.I.T.
Geotechnical Team Manager
CMcDaniel@ecslimited.com

Barnabas Bwambale, Ph.D., P.E.
Associate Principal Engineer
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Principal Engineer
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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

The purpose of this study was to provide geotechnical information for the design of the pavement rehabilitation of the existing runway, taxiways, and apron for the Curtis L. Brown Jr. Field Airport in Elizabethtown, North Carolina. The project will include pavement rehabilitation, fillet widening of existing taxiway connectors, the removal of one of the existing taxiway connectors, and the construction of a new taxiway. The recommendations developed for this report are based on project information supplied by Mr. Jason Kennedy with W.K. Dickson & Co., Inc.

Our services were provided in accordance with our Proposal No. 33:4844-R3 dated October 27, 2021, and the Subconsultant Contract for Professional Services between ECS Southeast, LLP and W.K. Dickson & Co., Inc, dated March 14, 2022.

This report contains the procedures and results of our subsurface exploration and laboratory testing programs, review of existing site conditions, engineering analyses, and recommendations for the design and construction of the project.

The report includes the following items.

- Observations from our site reconnaissance including current site conditions.
- Brief review of the published geologic conditions.
- Description of the field exploration and laboratory tests performed.
- Characterization of the subsurface conditions.
- Recommendations for the repair of the existing pavements.
- Evaluation of the on-site soil characteristics encountered at the testing locations, including reuse of on-site soil as engineered fill, compaction requirements and structural fill material guidelines.
- Site and boring location diagrams.
- Kessler Dynamic Cone Penetrometer (DCP) test data.
- Logs of the hand auger borings.
- Results of the laboratory testing.

2.0 PROJECT INFORMATION

2.1 SITE INFORMATION

The subject site is located at the Curtis L. Brown Jr. Field Airport at 466 Airport Road in Elizabethtown, North Carolina. The location of the site is shown on Figure 2.1.1 and indicated on the Site Location Diagram in Appendix A.

The site consists of an approximately 5,000-foot-long Runway 15-33 and the associated apron, taxiways, and buildings. The existing pavements are mostly asphalt, except a small portion of the apron near the fuel tanks which currently consists of concrete. According to the Inspection Report dated December 2019 prepared by RDM International, Inc., the runway, apron, and taxiways had PCI rating of satisfactory, fair, and good, respectively.

Figure 2.1.1. Site Location

2.2 EXISTING PAVEMENT CONDITIONS

On June 6, 2022, Ms. Caitlin Cerza with ECS and Mr. Jason Kennedy with W.K. Dickson visited the site to observe the existing site conditions of the runway and associated apron and taxiway pavements. Pavement defects observed on most pavements included minor to severe transverse and longitudinal cracking, and minor to moderate alligator cracking.

Apron: The existing concrete pavements primarily had minor transverse cracking with several longitudinal cracks observed in front of the above-ground fuel tanks near Boring A-01. The concrete pavements appeared to be worn and rough, with visible aggregates from the concrete mixture. The asphalt portion of the apron had moderate to severe transverse cracking across the entire airplane parking area. For example, relatively dee and wide longitudinal ad transverse cracks were observed near Borings A-02 and A-03.

Taxiways: Minor longitudinal and alligator cracking was observed along the centerline of the northern taxiway where T-01 is located. The other taxiways had minor to moderate longitudinal cracks mostly near the centerline.

Runway: Longitudinal, transverse, and alligator cracking were observed along most of the runway. Minor to moderate longitudinal cracking was consistent along the runway centerline. In addition, moderate longitudinal cracks were observed on either side of the centerline, often with moderate to severe transverse cracking in the areas with longitudinal cracking (for example near Boring R-14). Minor alligator cracking was observed mostly on the white lines on either side of the runway and moderate alligator cracking was observed on the thicker longitudinal white lines on either end of the runway.

2.3 PROPOSED CONSTRUCTION

The project will include pavement rehabilitation of Runway 15-33 and a section of the apron, removal of one taxiway connector which provides direct connection from an apron to the runway, replacement of the removed taxiway with construction of a new taxiway connector, and fillet widening of other existing taxiway connectors.

The purpose of this study was to perform a subsurface exploration to determine the existing pavement sections, evaluate the existing subgrade conditions, and provide recommendations for pavement design. The study followed the guidance of FAA AC 150/5320-6F for soils investigation and evaluation, and included borings within the existing runway, taxiway, and apron pavements and in locations of proposed taxiway connectors and taxiway fillet tapers. Information from borings and geotechnical study will be utilized for pavement design. We understand that W.K. Dickson will determine the final pavement design thicknesses California Bearing Ratio (CBR) and subgrade modulus (k) values of the using existing subgrade soils included in this geotechnical report.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 FIELD EXPLORATION

Kessler Dynamic Cone Penetrometer (KDCP) Testing: Our field exploration included coring through the existing asphalt and concrete pavements and performing hand auger borings to document the thickness of existing asphalt or concrete and the underlying base course, and to retrieve subgrade soil samples. Our scope included 17 testing locations along the runway (designated R-01 through R-17), 6 testing locations on the apron (designated A-01 through A-06), and 3 testing locations on the taxiway (designated T-01 through T-03). The testing locations were identified in the field with a handheld GPS unit using existing site features as reference and their approximate locations are shown on the Boring Location Diagrams in Appendix A.

Kessler Dynamic Cone Penetrometer (KDCP) testing was performed at each location to approximate depths of 2 to 3 feet below the bottom of the existing pavement in accordance with ASTM D6951 "Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications." This procedure involves continuously driving a conical point into the soil using a 17.6-pound cylindrical weight, falling freely a height of 22.6 inches. The depth of cone penetration is measured at selected hammer drop intervals and the soil shear strength is indicated by the DCP index. The KDCP penetration resistances were correlated with the California Bearing Ratio (CBR) values of the in-situ soils.

In addition, hand auger borings were performed to an approximate maximum depth of 5 feet below the asphalt surface at each location to determine the asphalt and aggregate base thicknesses and to allow for collection of subgrade soil samples. The borings were advanced by turning a 3-inch diameter hollow bucket with sharpened blades into the soil. Samples of the cuttings were collected at approximate 1-foot increments and returned to our laboratory for additional visual classification and testing.

Dynamic Cone Penetrometer (DCP) Testing: Our exploration also included 8 hand auger borings with DCP testing (6 borings within the locations of the proposed fillet widening, and 2 borings within the proposed new taxiway connector) to an approximate depth of 5 feet below the existing grades (designated D-01 through D-08). Our hand auger borings were located with a handheld GPS unit and their approximate locations are shown on the Boring Location Diagrams in Appendix A.

DCP testing was conducted in the hand auger borings at approximately 1-foot depth increments to determine the relative stiffness and shear strength of the soils in general accordance with ASTM Special Technical Publication #399. This testing technique consists of driving a conical point into the soils to be evaluated by means of a 15-pound weight which free falls along a slide rod a distance of 20 inches. The individual number of blows required to drive the point through three increments of 1¾ inches are recorded.

Representative soil samples were obtained from the auger cuttings in each boring at about 1-foot intervals for visual-manual soil classification in general accordance with the Unified Soil Classification System, and additional laboratory testing. At the completion of hand auger operations, the groundwater depths in the boreholes were measured.

3.2 LABORATORY TESTING

Each sample was visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). The laboratory testing consisted of selected tests performed on samples obtained during our field exploration operations.

Classification and index property tests were performed on representative soil samples in accordance with ASTM D2487 Standard Practice for Classification for Engineering Purposes (Unified Soil Classification System (USCS)). Classification and index property tests performed included natural moisture content, percent passing sieve number 200 (wash sieve), and Atterberg limits.

After identification and classification, the samples were grouped in the major zones noted on the hand auger boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

In addition, representative soil samples were mixed to obtain two composite bulk samples. The laboratory testing conducted on the resulting composite samples included natural moisture content, percent passing sieve number 200, Atterberg limits, standard Proctor, and California Bearing Ratio (CBR). Laboratory testing was performed in general accordance with applicable ASTM standards. The laboratory test results are presented in Appendix C.

3.3 SUBSURFACE CHARACTERIZATION

The site is located within the Coastal Plain physiographic province. The Coastal Plain is typically characterized by marine, alluvial, and aeolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. Basal formations are typical of those laid down in a shallow sloping sea bottom; dense sand, consolidated clay, limestone, chalk, marl, claystone, and sandstone. Overburden soils include marine interbedded gravel, sand, silt, and clay. Many of the clays have been preconsolidated by desiccation from frequent rising and lowering of the sea level and groundwater table. Alluvial gravel, sand, silt, and clay are typically present near rivers and creeks.

The generalized subsurface conditions encountered in the hand auger borings are described below. For soil stratification at a particular test location, the respective hand auger boring log found in Appendix B should be reviewed.

Existing Pavement Section Observations: The observed existing asphalt thicknesses ranged from 1.75 to 4.25 inches, and existing concrete thicknesses ranged from 4.25 to 5.5 inches. The aggregate base course (ABC) stone thicknesses generally ranged from approximately 5.5 to 11 inches. A summary of the data collected in the borings is provided in the table below.

Boring Location	Asphalt Thickness (inches)	Aggregate Base Course Thickness (inches)	Boring Location	Asphalt Thickness (inches)	Aggregate Base Course Thickness (inches)
Apron			**Runway**		
A-01	4.25*	Not Encountered	R-01	4	6
A-02	5.5*	5.5	R-02	4	8.5
A-03	4.25	8.75	R-03	4	7.25
A-04	4.25	8.75	R-04	3.5	7
A-05	1.75	6	R-05	4	6
A-06	3.75	9.75	R-06	4.25	7.25
	*Concrete		R-07	4	11
			R-08	3.5	5.5
			R-09	3.5	7.5
Taxiway			R-10	3.5	6.5
T-01	3.5	8.5	R-11	3.5	6.75
T-02	3.5	5.5	R-12	3.5	8.5
T-03	4	10	R-13	4.5	7
			R-14	3.25	7.5
			R-15	4	7.5
			R-16	3.75	6.75
			R-17	3.5	6.75

Apron: The KDCP test data in the Apron area generally indicated estimated in-situ CBR values of 10 or greater for the tested soils within the upper 2 feet. CBR values ranging from 2 to 8 were observed below the approximate depths of 1.75 and 1.5 feet at Borings A-01 and A-02, respectively. The subgrade soils beneath the surficial materials consisted of SAND (SP-SM, SM, SP).

Taxiway: The KDCP test data in the Taxiway areas generally indicated estimated in-situ CBR values of at least 10 for the tested soils, except at T-02 where a CBR value of 6 was estimated below the approximate depth of 2.5 feet. The subgrade soils beneath the surficial materials consisted of SAND (SM, SC, SP-SM, SP).

Runway: The KDCP test data along the Runway generally indicated estimated in-situ CBR values of 20 or greater for majority of the tested soils. Estimated CBR values ranging from 2 to 10 were observed below the approximate depths of 1.75 to 2.5 feet at R-11 through R-13 and R-15. Estimated CBR values at R-16 ranged from about 7 to 15 in the upper 1.5 feet. Existing fill materials consisting mainly of SAND (SC, SM, SP-SM) were encountered beneath the surficial materials in Borings R-02 through R-06, R-10, R-11, R-13, R-15, and R-17. The existing fill extended to depths of approximately 2 to 3 feet below the pavement surface. The natural soils encountered below the existing fill and/or surficial materials consisted mainly of SAND (SM, SP-SM, SC, SC-SM).

Fillet Widening: The hand auger borings in the fillet widening areas encountered approximately 2 to 4 inches of topsoil underlain by Coastal Plain classified as SAND (SM, SP-SM, SC, SP, SC-SM). The DCP blow counts in these materials ranged from 4 to 25+ blows per increment.

3.4 GROUNDWATER OBSERVATIONS

Water levels were measured in our hand auger borings as noted on the logs in Appendix B. Groundwater was encountered within R-16 at a depth of 2.5 feet below the runway surface. Groundwater was not encountered in other hand auger borings and the time of our field exploration within the boring termination depths. Variations in the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 SUBGRADE SOIL CHARACTERISTICS

Based on the results of our soil testing, the existing pavement subgrade soils consist mainly of SAND (SM, SP-SM, SC, SC-SM, and SP). These soils are generally considered suitable for the support of pavements. The in-situ CBR values estimated from the Kessler Dynamic Cone Penetrometer testing were generally greater than or equal to 10 within the upper 2 feet of the subgrade soils at majority of the test locations. The laboratory CBR testing conducted on two composite bulk samples yield CBR values of 12.5 to 13.8. For design purposes, a CBR value of 10 is recommended for this project, which is typical for similar soils. A modulus of subgrade reaction of 175 psi/in is recommended for design of rigid pavements bearing on unyielding natural soils and/or newly-placed and properly-compacted structural fill soils that can be successfully proofrolled according to the recommendations in this report.

4.2 PAVEMENT REPAIR RECOMMENDATIONS

Based on the results of our soil testing and our experience with similar projects, we recommend the repair of the existing pavements consist of an appropriately designed mill and structural overlay. The thickness of the mill and overlay should be determined by the project civil engineer but should not be less than 2 inches. We recommend that the existing pavements be improved as follows:

- Mill the existing runway asphalt course.
- Clean and seal any cracks 1/8 inch or greater with a hot applied asphalt-based crack sealant. Perform full depth repair of any localized areas of existing asphalt with fatigue cracking or excessive deterioration. Areas exhibiting signs of severe cracking or other pavement deterioration should be saw-cut, the deficient pavements removed, and the pavement section fully replaced.
- Place an FAA approved inter-layer geotextile to delay potential reflective cracking of new asphalt from existing underlying asphalt.
- Place at least 2 inches of asphalt surface course in general conformance with Part 6 of the 2018 FAA Advisory Circular (AC 150/5370-10H) - Standard Specifications for Construction of Airports or the latest version at the time of construction.

Pavement repair/construction should be in accordance with AC 150/5370-10H specifications or the latest FAA specifications at the time of construction. Prior to full depth repair of any localized areas, the subgrade soils should be evaluated by ECS. Any soft subgrades identified in the field should be repaired as recommended by ECS at the time of construction.

Alternatively, a complete removal and rebuild of the pavement section or milling with full depth reclamation and cement treated recycled asphalt aggregate base could be considered if a typical new pavement service life is desired for the repair. If desired, ECS should be contacted to discuss this option further.

4.3 CONSTRUCTION RECOMMENDATIONS

Subgrade Preparation: For areas where full depth repair is selected or otherwise new pavement sections, the subgrade preparation should consist of removal of the existing asphalt pavements and any other soft, unsuitable, or deleterious materials. The removal of existing pavements and preparation of the subgrade should be performed in accordance with the applicable FAA specifications. ECS should be retained to document that the unsuitable surficial materials have been removed prior to placement of any structural fill or construction of the new pavement sections.

Proofrolling: Prior to the placement of any structural fill or other construction materials, the subgrade should be evaluated by ECS. The exposed subgrade should be thoroughly proofrolled with a loaded 20-ton tandem-axle dual wheel dump truck under the observation of ECS. This procedure is intended to assist in identifying any localized yielding subgrade materials. Where proofrolling identifies areas that are unstable or “pumping” subgrade, those areas should be repaired prior to placement of any subsequent structural fill or other construction materials. Methods of stabilization include undercutting or moisture conditioning. Undercut excavations should be backfilled with properly placed and compacted structural fill.

Structural Fill: As needed for subgrade repairs, structural fill materials should consist of material with less than 2 percent organic matter, free of debris, with a Liquid Limit less than 30, Plasticity Index less than 12, and have no more than 35% passing the number 200 sieve. Import materials should be tested prior to being hauled to the site to determine if they meet project specifications.

Fill Placement and Compaction: Grade control should be maintained throughout the fill placement operations. All fill operations should be observed on a full-time basis by ECS to determine that minimum compaction requirements in the table below are being met. A minimum of one compaction test per 2,500 square foot area should be performed in every lift. The elevation and location of the tests should be clearly identified and recorded at the time of fill placement.

STRUCTURAL FILL COMPACTION REQUIREMENTS	
Subject	**Requirement**
Compaction Standard	Standard Proctor, ASTM D698
Required Compaction	100% of Max. Dry Density within top 12 inches, and 95% elsewhere
Moisture Content	Within ±2% of optimum moisture content
Loose Thickness	8 inches prior to compaction

5.0 CLOSING

ECS has prepared this report to guide the geotechnical-related design and construction aspects of the project. We performed these services in accordance with the standard of care expected of professionals in the industry performing similar services on projects of like size and complexity at this time in the region. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this report.

The description of the proposed project is based on information provided to ECS by WK Dickson & Co., Inc. If any of this information is inaccurate or changes, either because of our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted so we can review our recommendations and provide additional or alternate recommendations that reflect the proposed construction.

We recommend that ECS review the project plans and specifications so we can confirm that those plans/specifications are in accordance with the recommendations of this geotechnical report.

Field observations, and quality assurance testing during earthwork and foundation installation are an extension of, and integral to, the geotechnical design. We recommend that ECS be retained to apply our expertise throughout the geotechnical phases of construction, and to provide consultation and recommendation should issues arise.

ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Diagrams & Reports

Site Location Diagram
Boring Location Diagrams

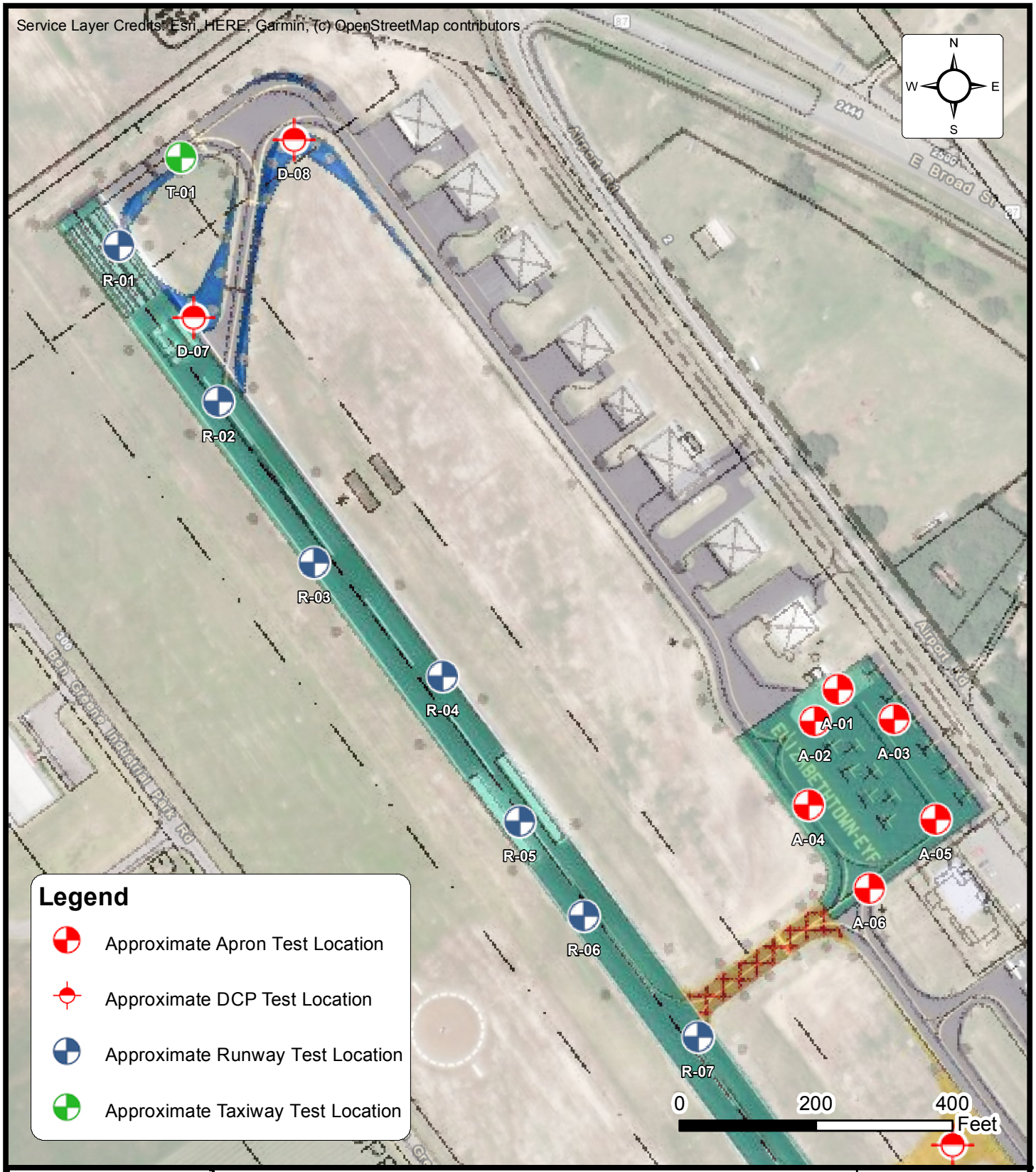
SITE LOCATION DIAGRAM

ELIZABETHTOWN RUNWAY PAVEMENT REHAB

466 AIRPORT RD, ELIZABETHTOWN, NC

WK DICKSON & CO., INC.

ENGINEER	WEG
SCALE	AS NOTED
PROJECT NO.	33:5931
FIGURE	1 OF 4
DATE	7/27/2022



BORING LOCATION DIAGRAM

ELIZABETHTOWN RUNWAY PAVEMENT REHAB

466 AIRPORT RD, ELIZABETHTOWN, NC

WK DICKSON & CO., INC.

ENGINEER	WEG
SCALE	AS NOTED
PROJECT NO.	33:5931
FIGURE	2 OF 4
DATE	7/27/2022

BORING LOCATION DIAGRAM

ELIZABETHTOWN RUNWAY PAVEMENT REHAB

466 AIRPORT RD, ELIZABETHTOWN, NC

WK DICKSON & CO., INC.

ENGINEER	WEG
SCALE	AS NOTED
PROJECT NO.	33:5931
FIGURE	3 OF 4
DATE	7/27/2022

BORING LOCATION DIAGRAM

ELIZABETHTOWN RUNWAY PAVEMENT REHAB

466 AIRPORT RD, ELIZABETHTOWN, NC

WK DICKSON & CO., INC.

ENGINEER	WEG
SCALE	AS NOTED
PROJECT NO.	33:5931
FIGURE	4 OF 4
DATE	7/27/2022

APPENDIX B – Field Operations

Hand Auger Boring Logs
Kessler Dynamic Cone Penetrometer Logs
Asphalt/Concrete Core Photographs

DCP TEST DATA

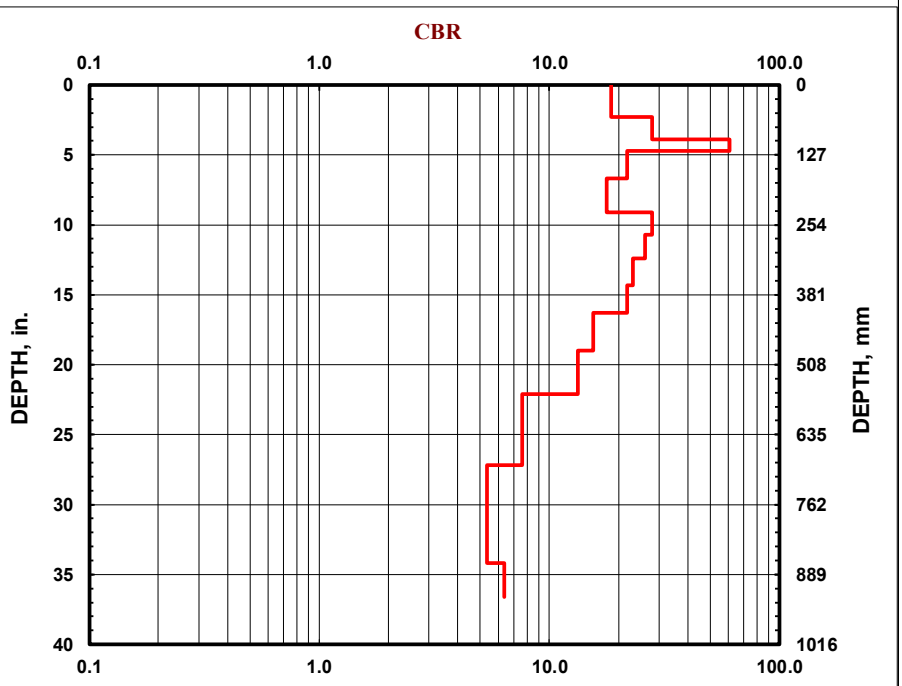
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

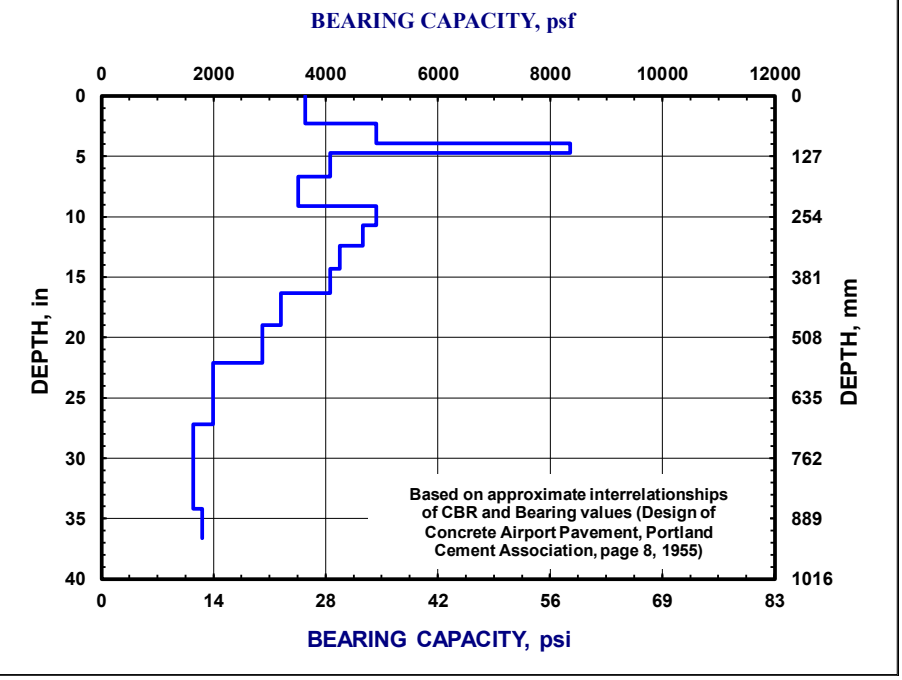
Location: A-01 **Soil Type(s):** SAND (SP-SM, SP)

Hammer
- ○ 10.1 lbs.
- ● 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ● All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	58.42	1
5	99.06	1
5	119.38	1
5	170.18	1
5	231.14	1
5	271.78	1
5	314.96	1
5	363.22	1
5	414.02	1
5	482.6	1
5	561.34	1
5	690.88	1
5	868.68	1
2	929.64	1





DCP TEST DATA

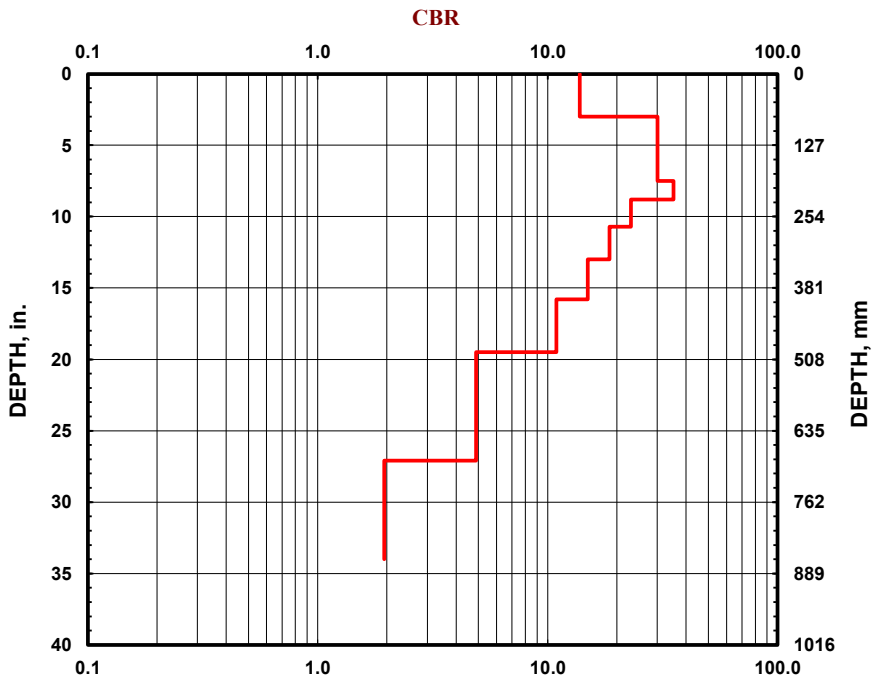
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

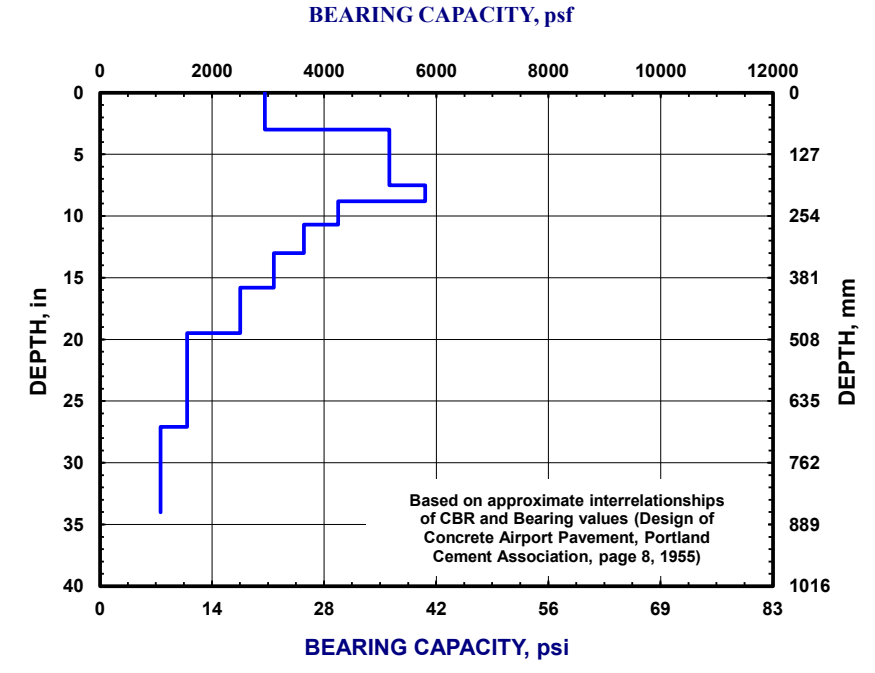
Location: A-02 **Soil Type(s):** SAND (SP-SM, SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	76.2	1
5	114.3	1
5	152.4	1
5	190.5	1
5	223.52	1
5	271.78	1
5	330.2	1
5	401.32	1
5	495.3	1
5	688.34	1
2	863.6	1





DCP TEST DATA

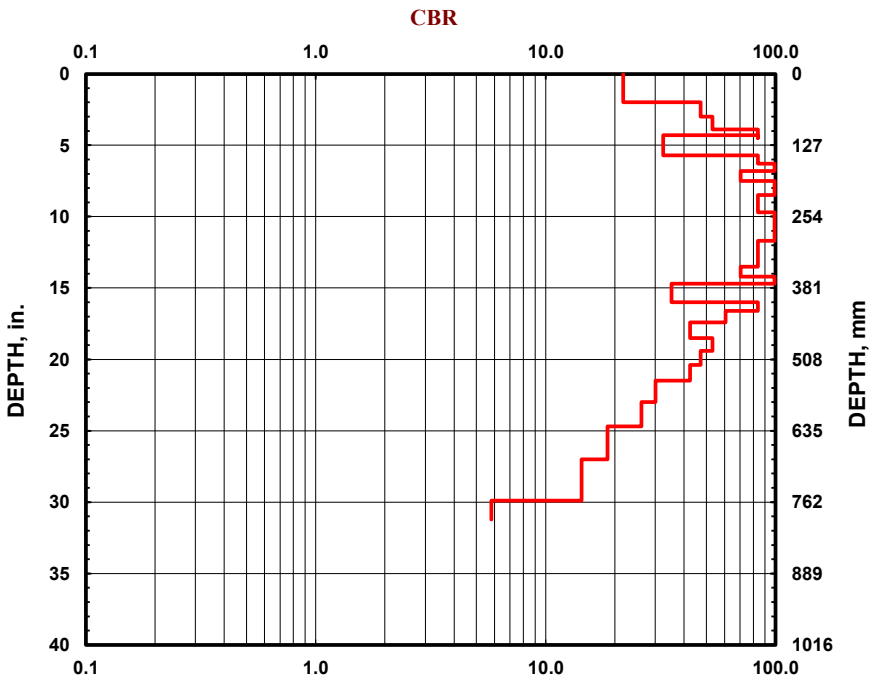
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

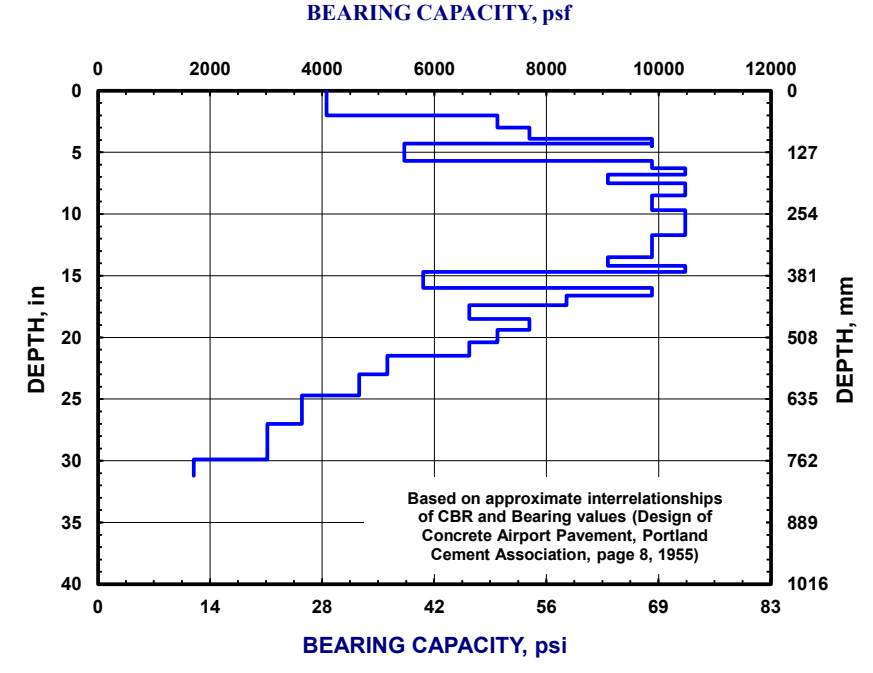
Location: A-03 **Soil Type(s):** SAND (SP-SM, SP)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	50.8	1
5	76.2	1
5	99.06	1
5	114.3	1
5	109.22	1
5	144.78	1
5	160.02	1
5	172.72	1
5	190.5	1
5	203.2	1
5	215.9	1
5	231.14	1
5	246.38	1
5	259.08	1
5	271.78	1
5	284.48	1
5	297.18	1
5	312.42	1
5	327.66	1
5	342.9	1
5	360.68	1
5	373.38	1
5	406.4	1
5	421.64	1
5	441.96	1
5	469.9	1
5	492.76	1
5	518.16	1
5	546.1	1
5	584.2	1
5	627.38	1
5	685.8	1
5	759.46	1
1	792.48	1





DCP TEST DATA

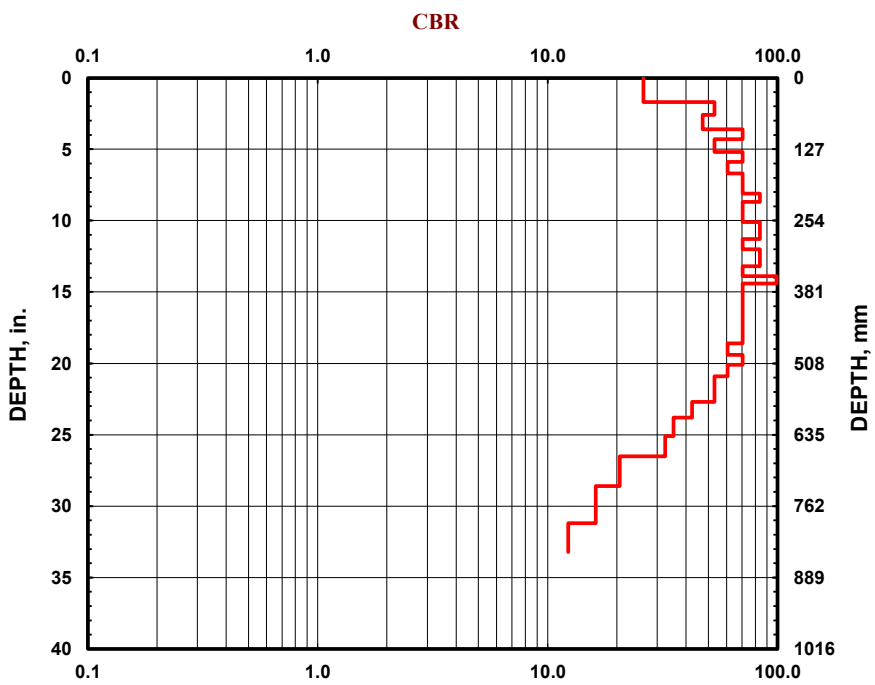
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

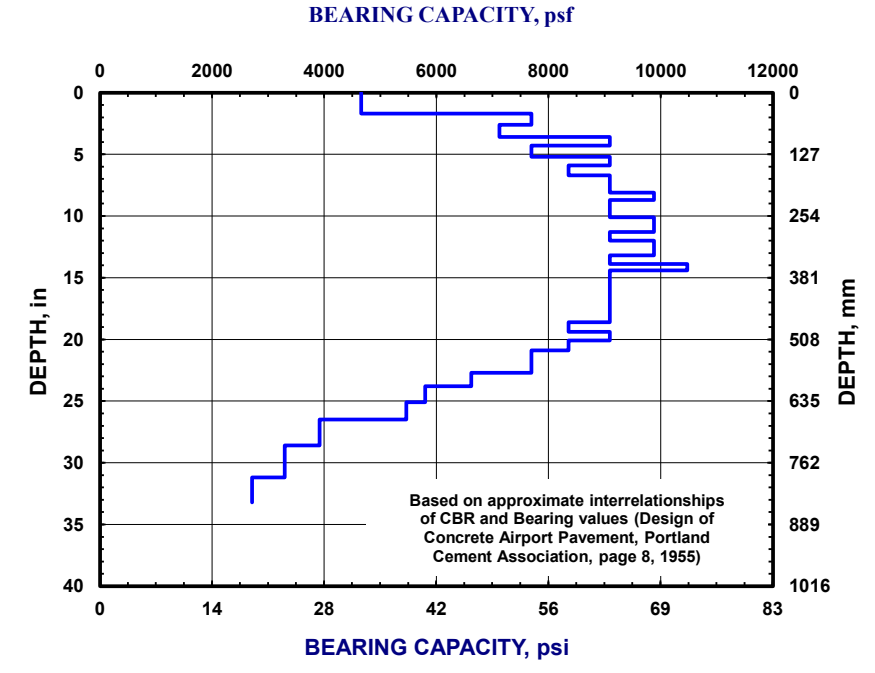
Location: A-04 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	43.18	1
5	66.04	1
5	91.44	1
5	109.22	1
5	132.08	1
5	149.86	1
5	170.18	1
5	187.96	1
5	205.74	1
5	220.98	1
5	238.76	1
5	256.54	1
5	271.78	1
5	287.02	1
5	304.8	1
5	320.04	1
5	335.28	1
5	353.06	1
5	365.76	1
5	383.54	1
5	401.32	1
5	419.1	1
5	436.88	1
5	454.66	1
5	472.44	1
5	492.76	1
5	510.54	1
5	530.86	1
5	553.72	1
5	576.58	1
5	604.52	1
5	637.54	1
5	673.1	1
5	726.44	1
5	792.48	1
3	843.28	1





DCP TEST DATA

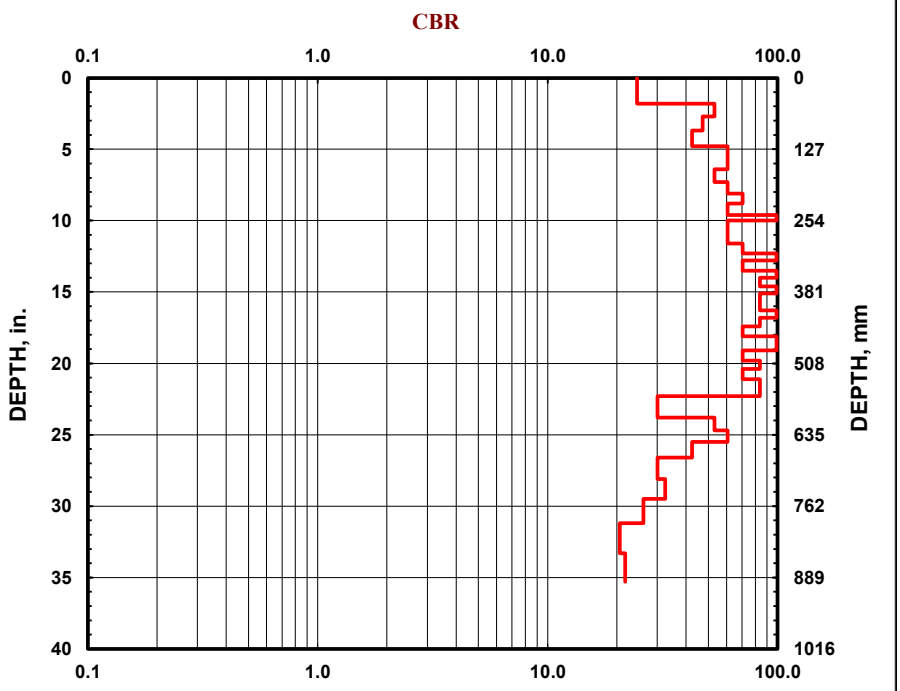
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

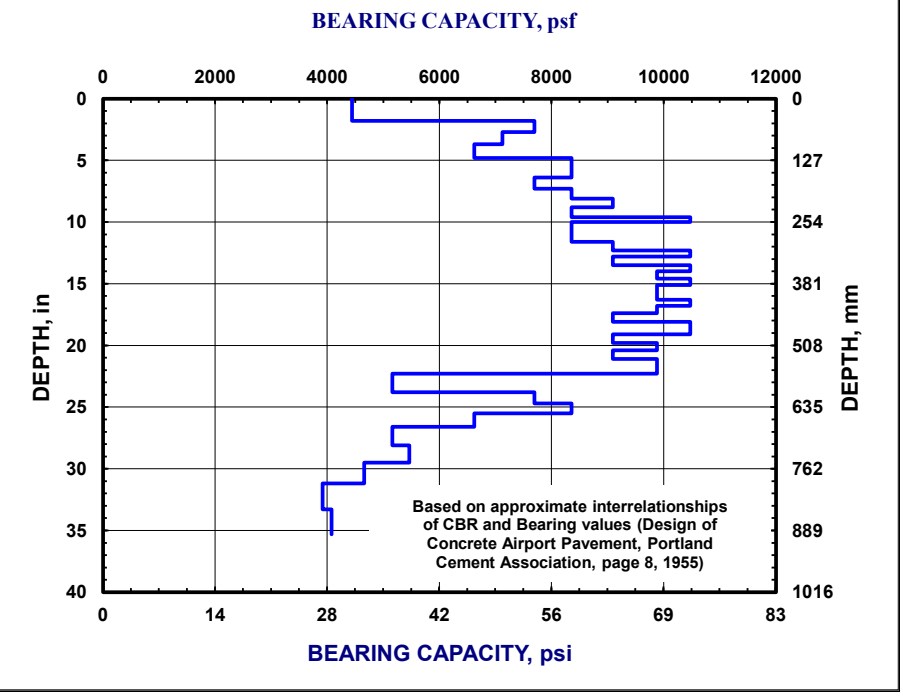
Location: A-05 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	45.72	1
5	68.58	1
5	93.98	1
5	121.92	1
5	142.24	1
5	162.56	1
5	185.42	1
5	205.74	1
5	223.52	1
5	243.84	1
5	254	1
5	274.32	1
5	294.64	1
5	312.42	1
5	325.12	1
5	342.9	1
5	355.6	1
5	370.84	1
5	383.54	1
5	398.78	1
5	414.02	1
5	426.72	1
5	441.96	1
5	459.74	1
5	472.44	1
5	485.14	1
5	502.92	1
5	518.16	1
5	535.94	1
5	551.18	1
5	566.42	1
5	604.52	1
5	627.38	1
5	647.7	1
5	675.64	1
5	713.74	1
5	749.3	1
5	792.48	1
5	845.82	1
5	896.62	1





DCP TEST DATA

Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

Location: A-06 **Soil Type(s):** SAND (SM, SP-SM, SP)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	45.72	1
5	68.58	1
5	88.9	1
5	106.68	1
5	124.46	1
5	139.7	1
5	157.48	1
5	170.18	1
5	180.34	1
5	195.58	1
5	220.98	1
5	231.14	1
5	246.38	1
5	259.08	1
5	271.78	1
5	276.86	1
5	297.18	1
5	309.88	1
5	322.58	1
5	335.28	1
5	347.98	1
5	360.68	1
5	373.38	1
5	386.08	1
5	398.78	1
5	414.02	1
5	426.72	1
5	441.96	1
5	459.74	1
5	477.52	1
5	497.84	1
5	525.78	1
5	551.18	1
5	579.12	1
5	614.68	1
5	650.24	1
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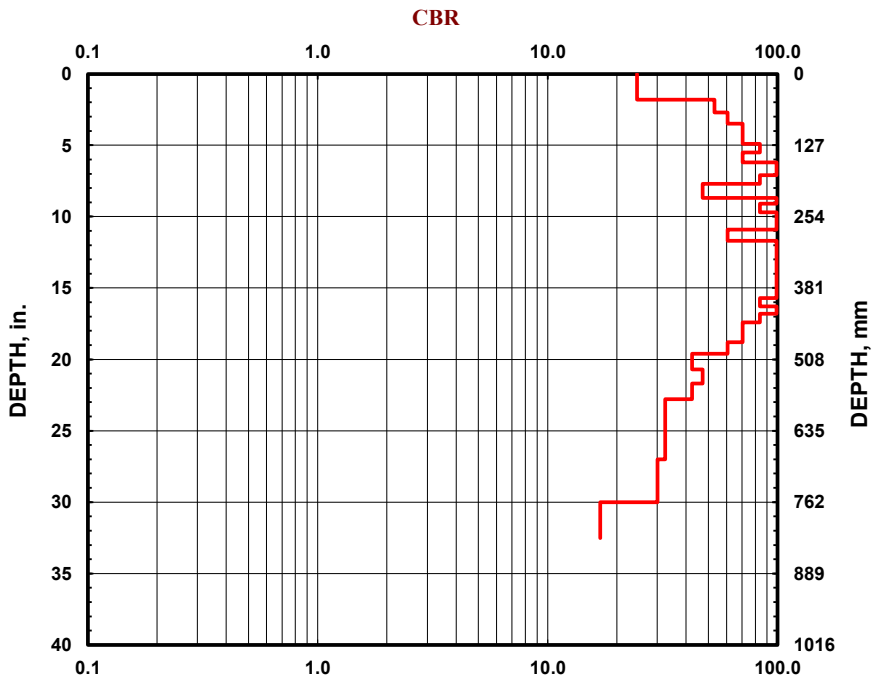
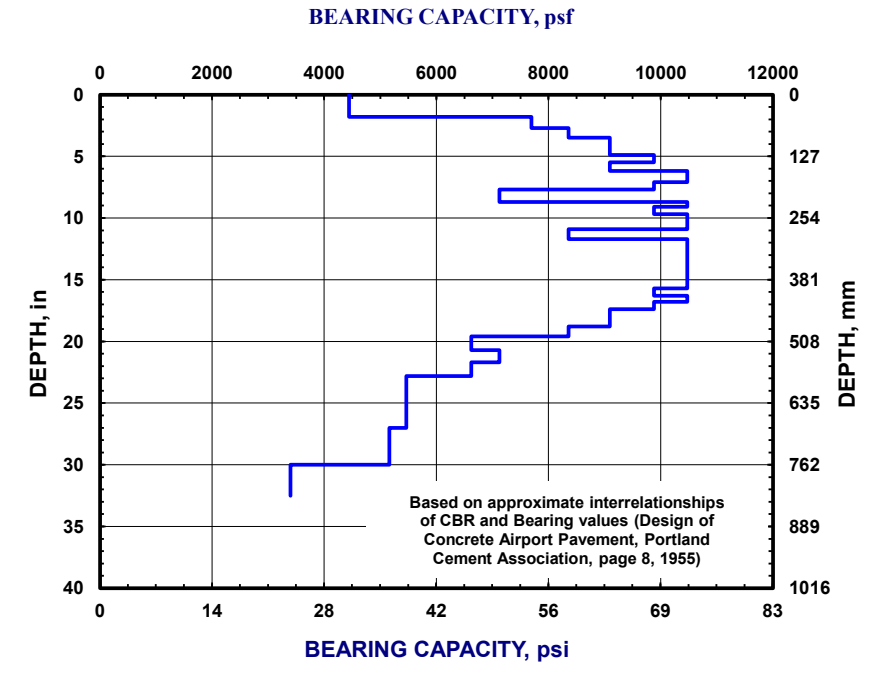
5	723.9	1
5	762	1
5	825.5	1





DCP TEST DATA

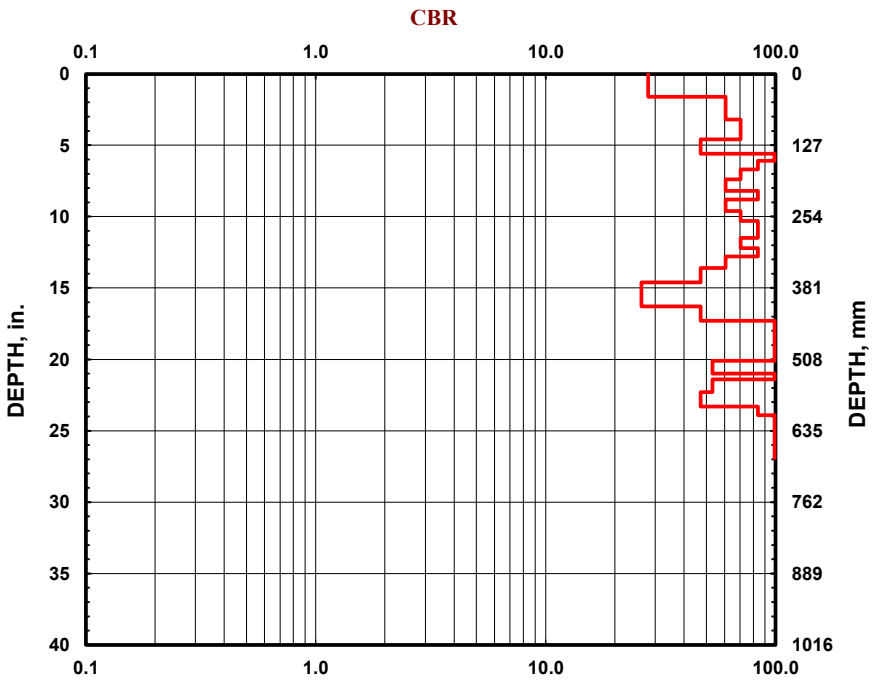
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

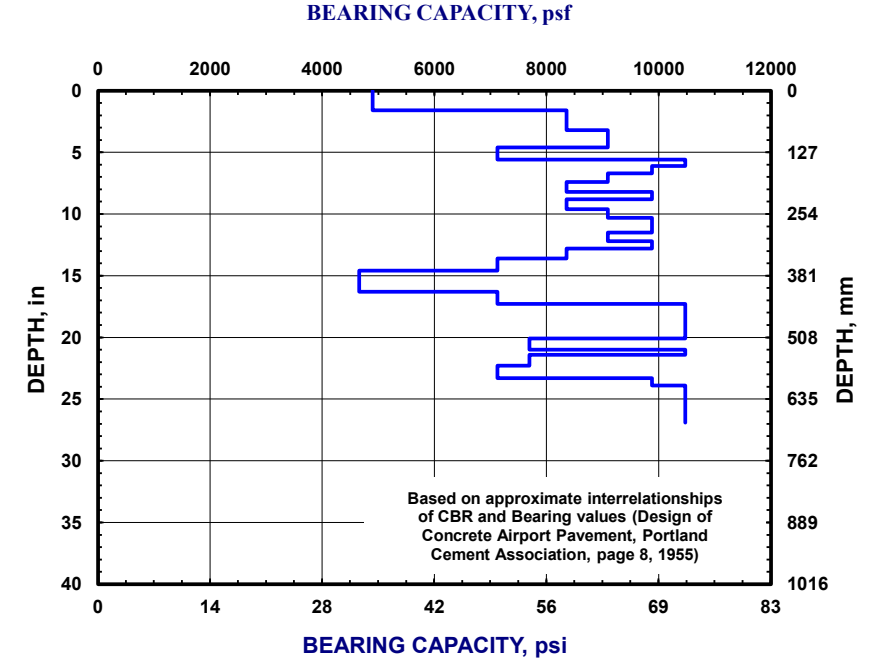
Location: R-01 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	40.64	1
5	60.96	1
5	81.28	1
5	99.06	1
5	116.84	1
5	142.24	1
5	154.94	1
5	170.18	1
5	187.96	1
5	208.28	1
5	223.52	1
5	243.84	1
5	261.62	1
5	276.86	1
5	292.1	1
5	309.88	1
5	325.12	1
5	345.44	1
5	370.84	1
5	414.02	1
5	439.42	1
5	452.12	1
5	462.28	1
5	474.98	1
5	487.68	1
5	497.84	1
5	510.54	1
5	533.4	1
5	543.56	1
5	566.42	1
5	591.82	1
5	607.06	1
5	619.76	1
5	627.38	1
5	637.54	1
5	647.7	1
5	652.78	1
5	660.4	1
5	668.02	1
5	675.64	1
5	683.26	1
5	690.88	1





DCP TEST DATA

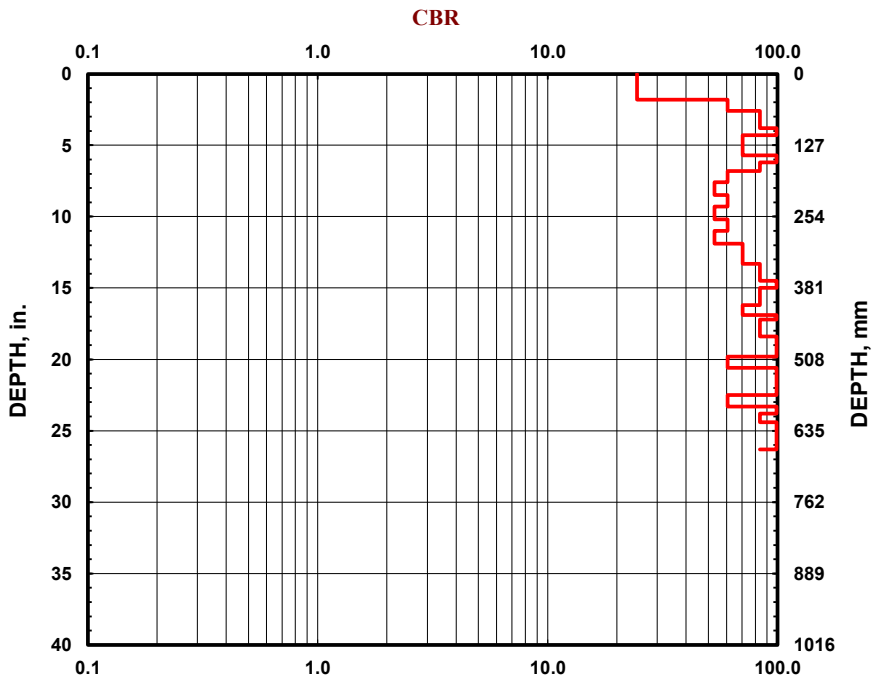
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

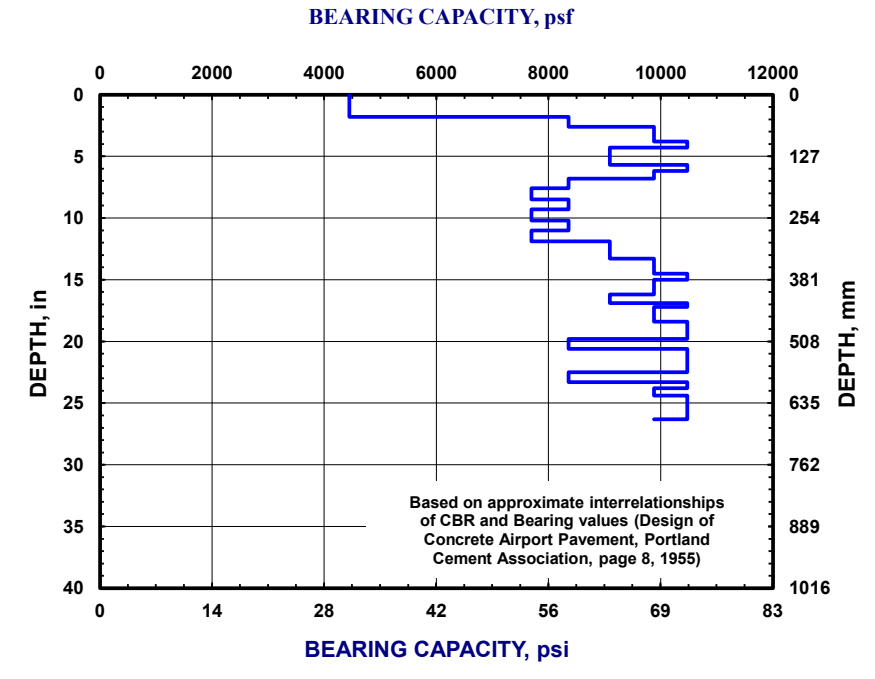
Location: R-02 **Soil Type(s):** SAND (SM, SC, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	45.72	1
5	66.04	1
5	81.28	1
5	96.52	1
5	109.22	1
5	127	1
5	144.78	1
5	157.48	1
5	172.72	1
5	193.04	1
5	215.9	1
5	236.22	1
5	259.08	1
5	279.4	1
5	302.26	1
5	320.04	1
5	337.82	1
5	353.06	1
5	368.3	1
5	381	1
5	396.24	1
5	411.48	1
5	429.26	1
5	436.88	1
5	452.12	1
5	467.36	1
5	480.06	1
5	490.22	1
5	502.92	1
5	523.24	1
5	535.94	1
5	546.1	1
5	558.8	1
5	571.5	1
5	591.82	1
5	604.52	1
5	619.76	1
5	632.46	1
5	645.16	1
5	657.86	1
5	668.02	1
5	683.26	1





DCP TEST DATA

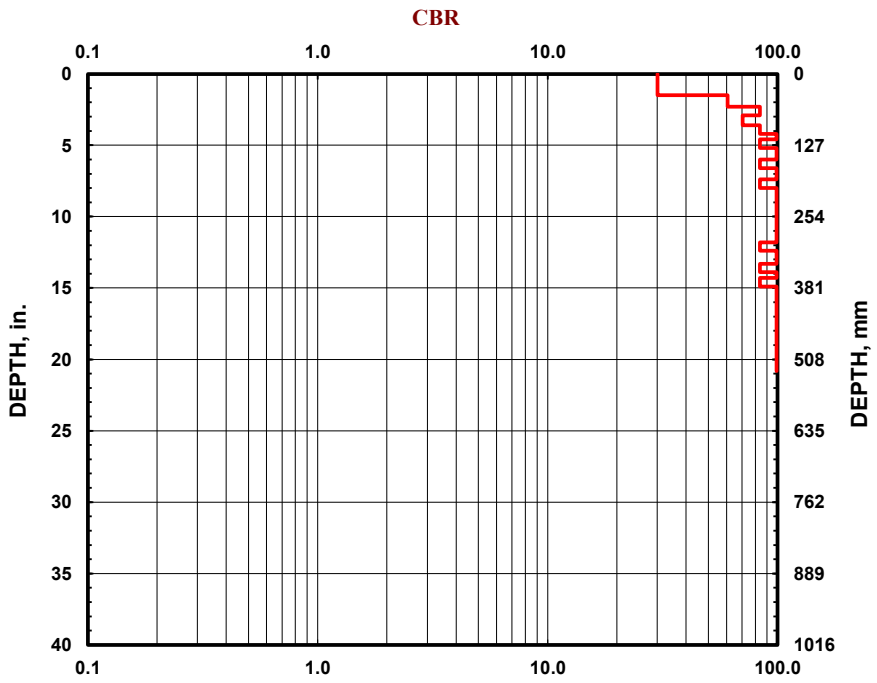
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

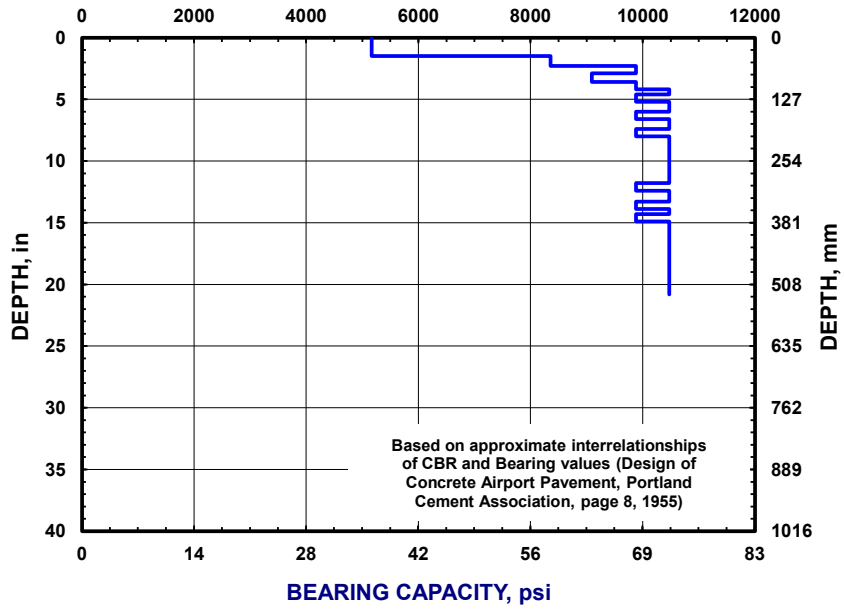
Location: R-03 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	38.1	1
5	58.42	1
5	73.66	1
5	91.44	1
5	106.68	1
5	116.84	1
5	132.08	1
5	142.24	1
5	152.4	1
5	167.64	1
5	177.8	1
5	187.96	1
5	203.2	1
5	210.82	1
5	220.98	1
5	231.14	1
5	243.84	1
5	254	1
5	264.16	1
5	276.86	1
5	287.02	1
5	299.72	1
5	314.96	1
5	327.66	1
5	337.82	1
5	353.06	1
5	363.22	1
5	378.46	1
5	388.62	1
5	398.78	1
5	411.48	1
5	424.18	1
5	434.34	1
5	447.04	1
5	457.2	1
5	467.36	1
5	480.06	1
5	492.76	1
5	505.46	1
5	518.16	1
5	528.32	1
5	541.02	1





DCP TEST DATA

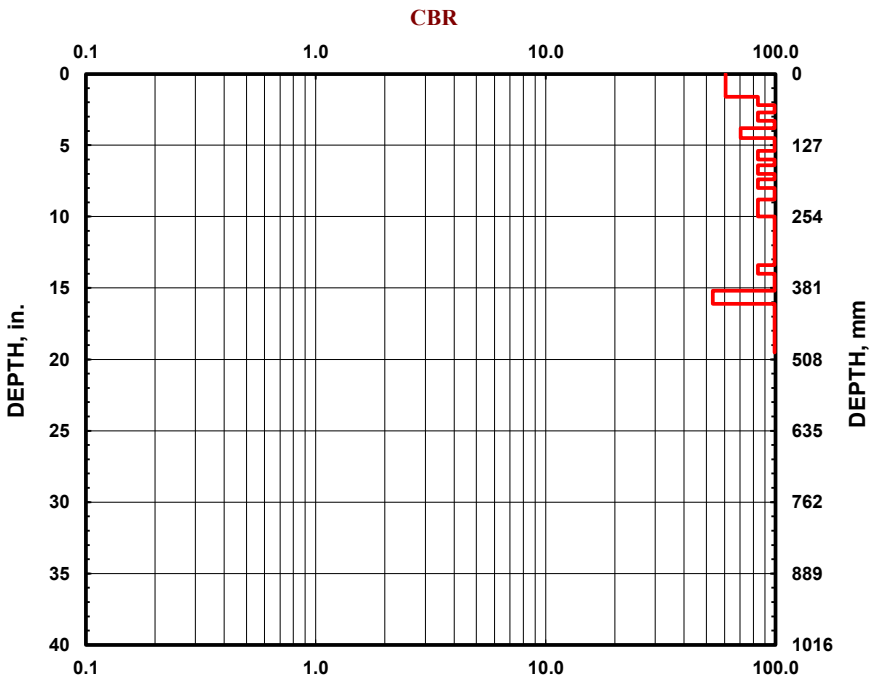
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

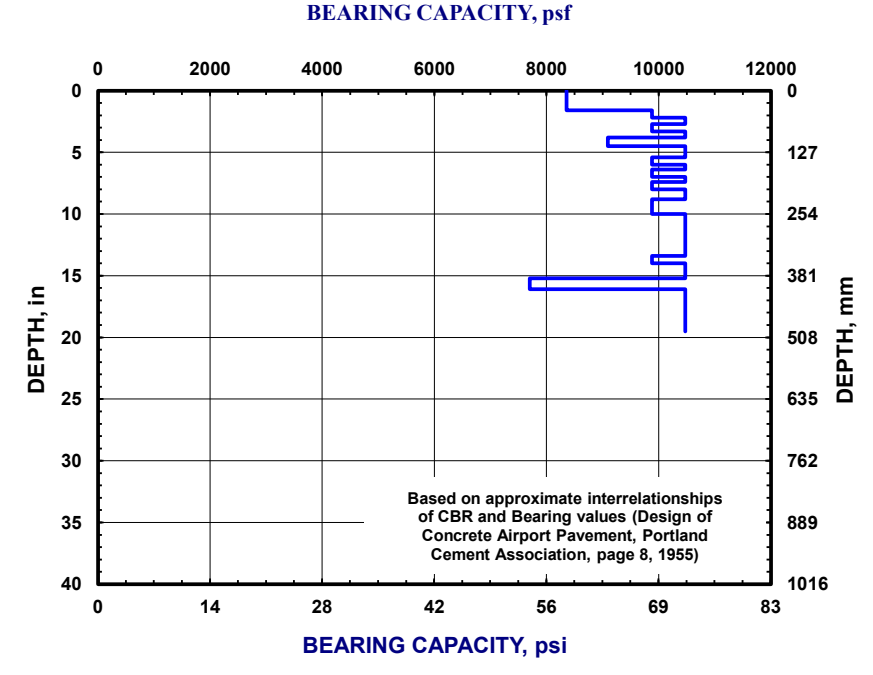
Location: R-04 **Soil Type(s):** SAND (SM, SC, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	20.32	1
5	40.64	1
5	55.88	1
5	68.58	1
5	83.82	1
5	96.52	1
5	114.3	1
5	127	1
5	137.16	1
5	152.4	1
5	162.56	1
5	177.8	1
5	187.96	1
5	203.2	1
5	213.36	1
5	223.52	1
5	238.76	1
5	254	1
5	261.62	1
5	274.32	1
5	284.48	1
5	297.18	1
5	309.88	1
5	320.04	1
5	330.2	1
5	340.36	1
5	355.6	1
5	363.22	1
5	373.38	1
5	386.08	1
5	408.94	1
5	419.1	1
5	426.72	1
5	436.88	1
5	444.5	1
5	454.66	1
5	462.28	1
5	472.44	1
5	480.06	1
5	487.68	1
5	495.3	1
5	502.92	1





DCP TEST DATA

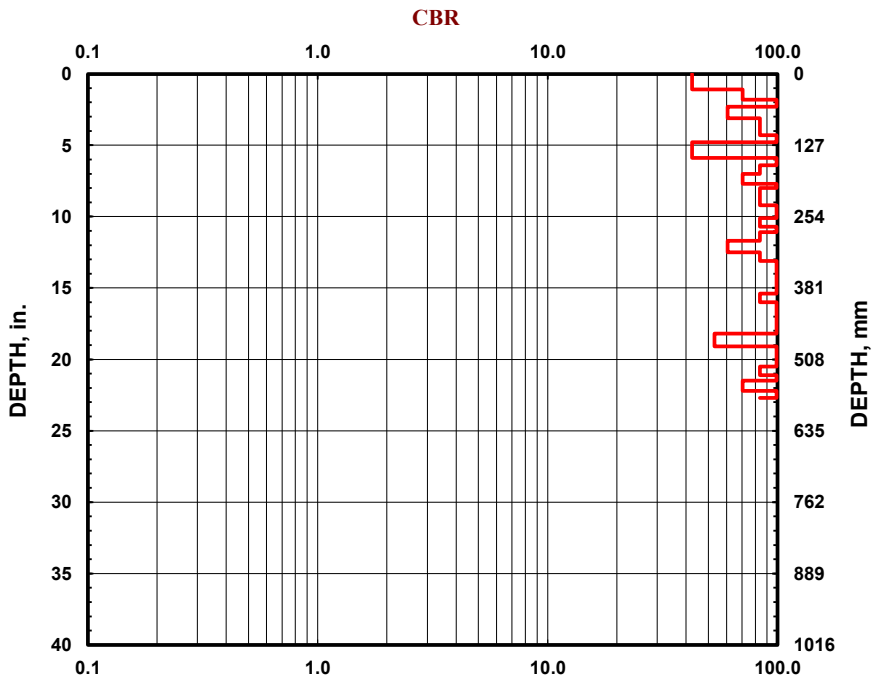
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

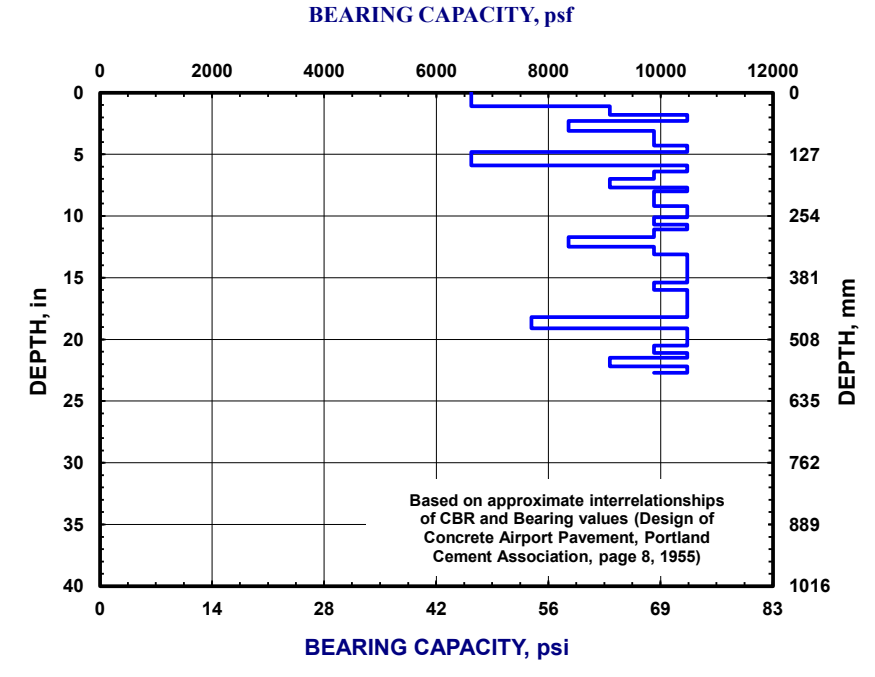
Location: R-05 **Soil Type(s):** SAND (SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	27.94	1
5	45.72	1
5	58.42	1
5	78.74	1
5	93.98	1
5	109.22	1
5	121.92	1
5	149.86	1
5	162.56	1
5	177.8	1
5	195.58	1
5	203.2	1
5	218.44	1
5	233.68	1
5	246.38	1
5	256.54	1
5	271.78	1
5	281.94	1
5	297.18	1
5	317.5	1
5	332.74	1
5	342.9	1
5	353.06	1
5	363.22	1
5	373.38	1
5	381	1
5	391.16	1
5	406.4	1
5	414.02	1
5	426.72	1
5	439.42	1
5	449.58	1
5	462.28	1
5	485.14	1
5	495.3	1
5	508	1
5	520.7	1
5	535.94	1
5	546.1	1
5	563.88	1
5	576.58	1
5	591.82	1





DCP TEST DATA

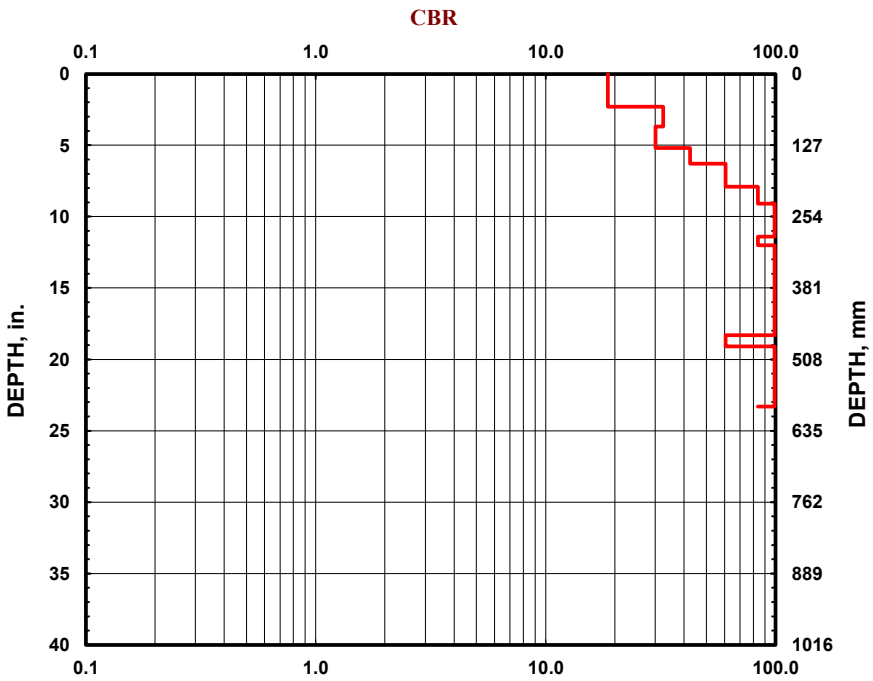
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

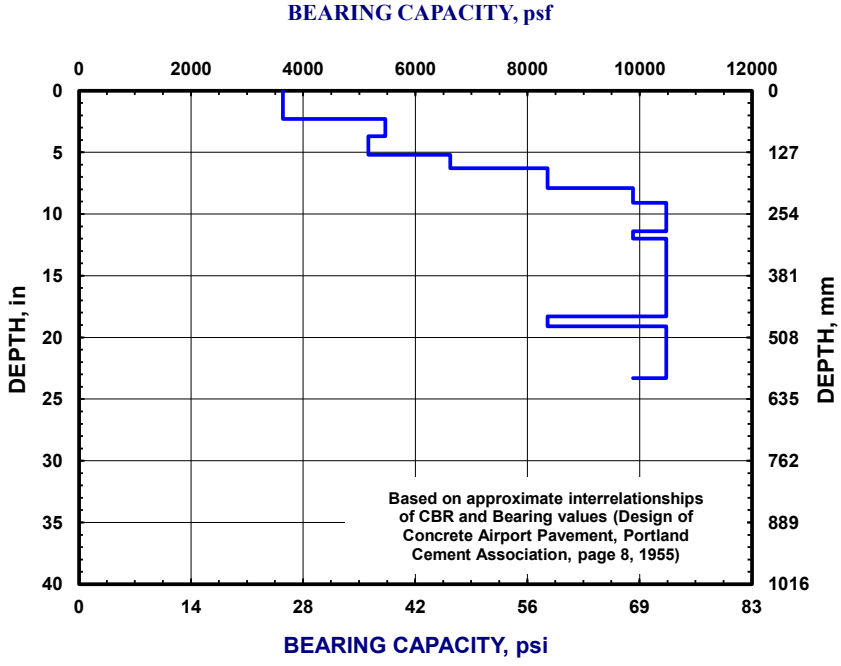
Location: R-06 **Soil Type(s):** SAND (SC, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	58.42	1
5	93.98	1
5	132.08	1
5	160.02	1
5	180.34	1
5	200.66	1
5	215.9	1
5	231.14	1
5	243.84	1
5	256.54	1
5	269.24	1
5	279.4	1
5	289.56	1
5	304.8	1
5	314.96	1
5	325.12	1
5	335.28	1
5	345.44	1
5	355.6	1
5	363.22	1
5	373.38	1
5	383.54	1
5	396.24	1
5	408.94	1
5	421.64	1
5	431.8	1
5	441.96	1
5	454.66	1
5	464.82	1
5	485.14	1
5	497.84	1
5	505.46	1
5	515.62	1
5	525.78	1
5	535.94	1
5	546.1	1
5	558.546	1
5	566.42	1
5	574.04	1
5	584.2	1
5	591.82	1
5	607.06	1





DCP TEST DATA

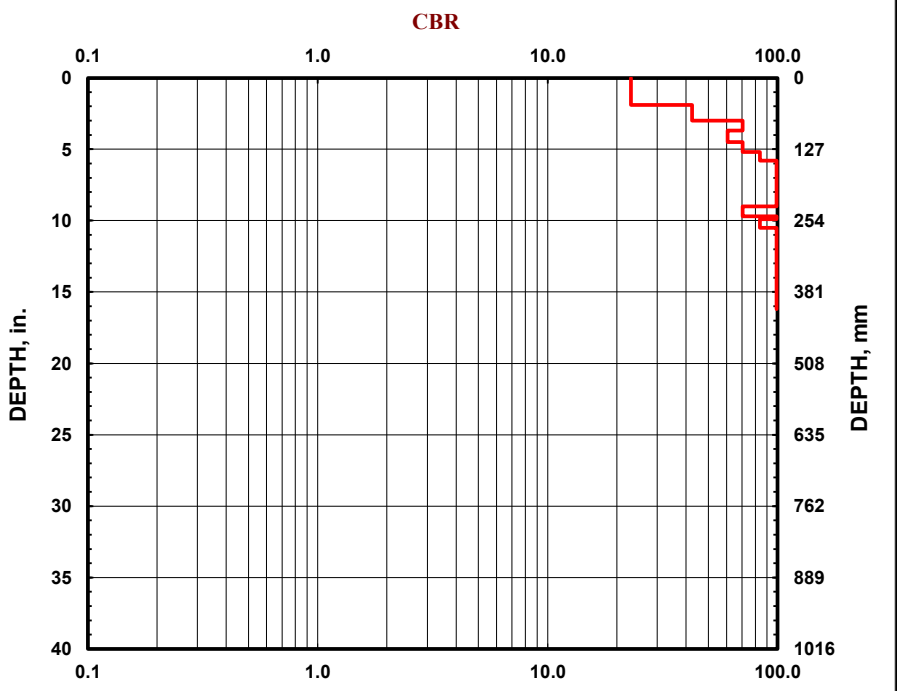
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 23-Jun-22

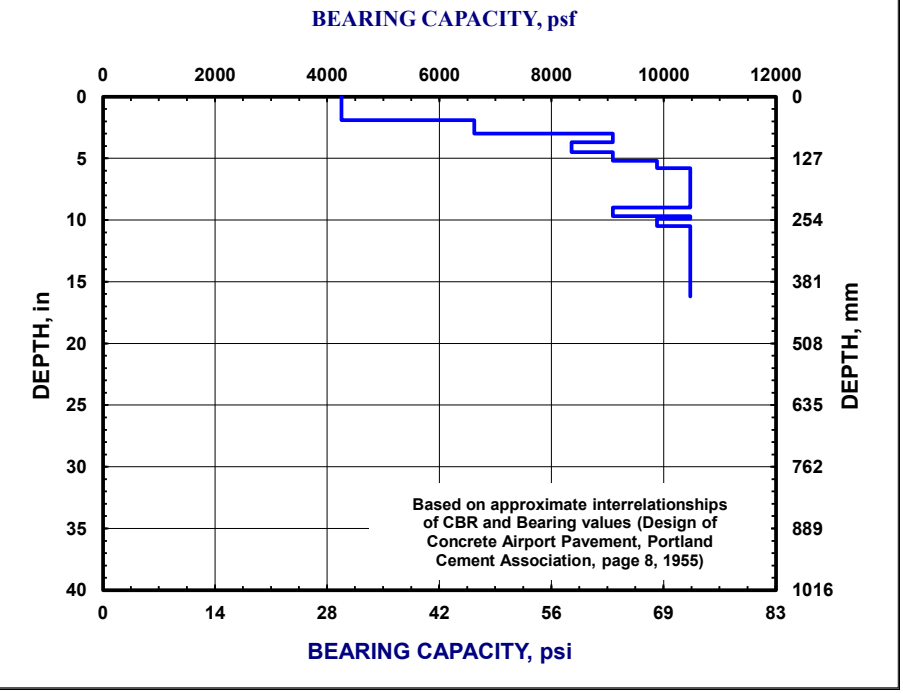
Location: R-07 **Soil Type(s):** SAND (SP-SM, SP, SC)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	48.26	1
5	76.2	1
5	93.98	1
5	114.3	1
5	132.08	1
5	147.32	1
5	157.48	1
5	167.64	1
5	180.34	1
5	187.96	1
5	198.12	1
5	205.74	1
5	213.36	1
5	220.98	1
5	228.6	1
5	246.38	1
5	251.46	1
5	266.7	1
5	271.78	1
5	276.86	1
5	284.48	1
5	287.02	1
5	292.1	1
5	299.72	1
5	307.34	1
5	312.42	1
5	320.04	1
5	325.12	1
5	330.2	1
5	337.82	1
5	342.9	1
5	347.98	1
5	355.6	1
5	360.68	1
5	368.3	1
5	378.46	1
5	386.08	1
5	393.7	1
5	396.24	1
5	403.86	1
5	411.48	1
5	416.56	1





DCP TEST DATA

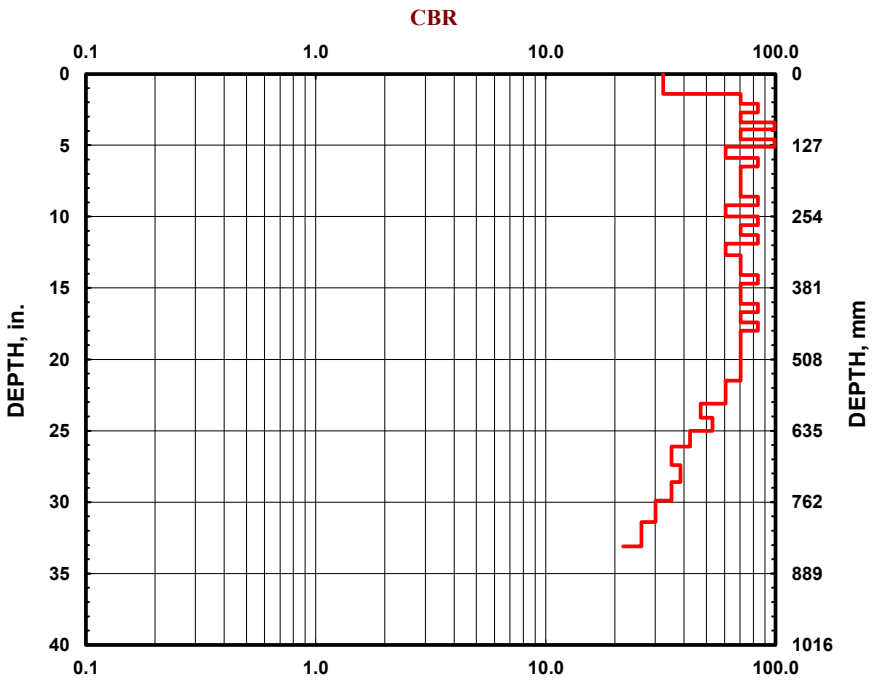
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

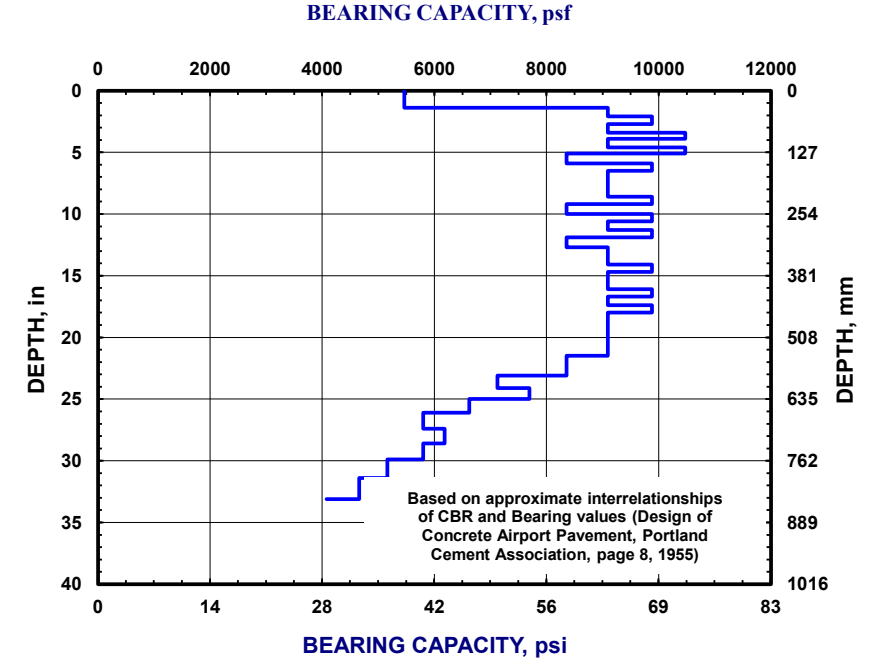
Location: R-08 **Soil Type(s):** SAND (SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	35.56	1
5	53.34	1
5	68.58	1
5	86.36	1
5	99.06	1
5	116.84	1
5	129.54	1
5	149.86	1
5	165.1	1
5	182.88	1
5	200.66	1
5	218.44	1
5	233.68	1
5	254	1
5	269.24	1
5	287.02	1
5	302.26	1
5	322.58	1
5	340.36	1
5	358.14	1
5	373.38	1
5	391.16	1
5	408.94	1
5	424.18	1
5	441.96	1
5	457.2	1
5	474.98	1
5	492.76	1
5	510.54	1
5	528.32	1
5	546.1	1
5	566.42	1
5	586.74	1
5	612.14	1
5	635	1
5	662.94	1
5	695.96	1
5	726.44	1
5	759.46	1
5	797.56	1
5	840.74	1
5	891.54	1





DCP TEST DATA

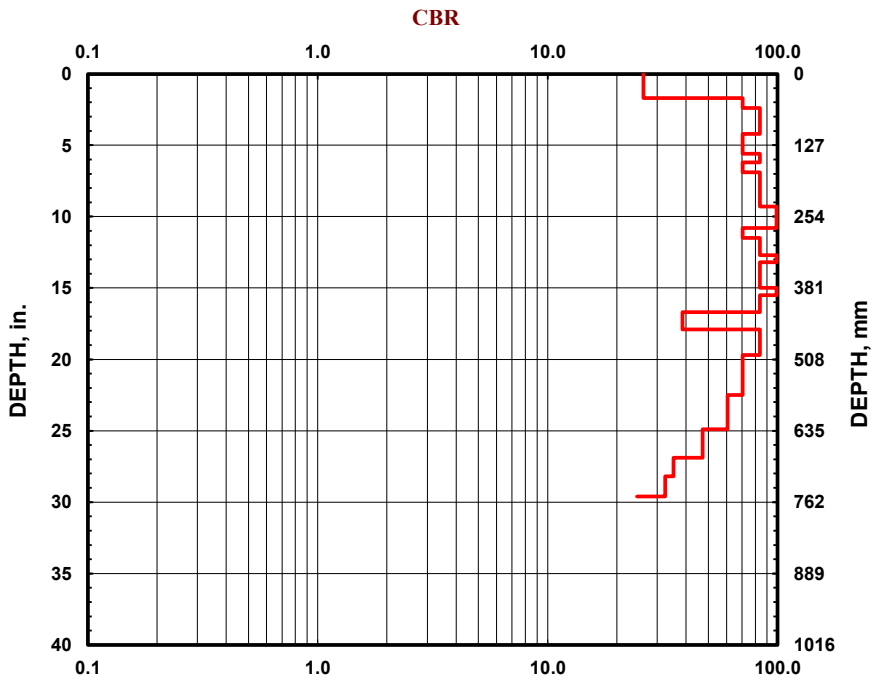
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

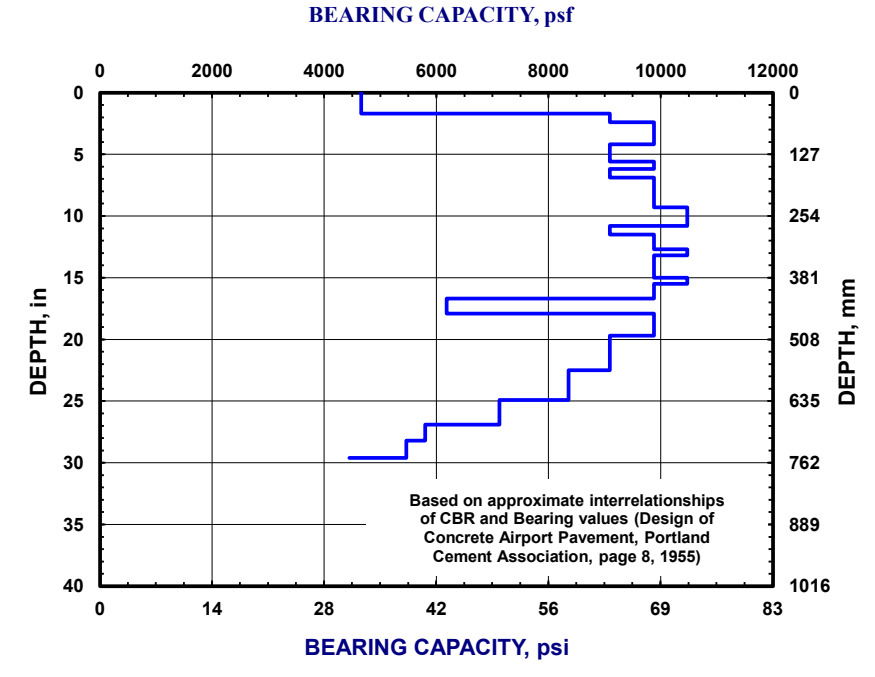
Location: R-09 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	43.18	1
5	60.96	1
5	76.2	1
5	91.44	1
5	106.68	1
5	124.46	1
5	142.24	1
5	157.48	1
5	175.26	1
5	190.5	1
5	205.74	1
5	220.98	1
5	236.22	1
5	248.92	1
5	261.62	1
5	274.32	1
5	292.1	1
5	307.34	1
5	322.58	1
5	335.28	1
5	350.52	1
5	365.76	1
5	381	1
5	393.7	1
5	408.94	1
5	424.18	1
5	454.66	1
5	469.9	1
5	485.14	1
5	500.38	1
5	518.16	1
5	535.94	1
5	553.72	1
5	571.5	1
5	591.82	1
5	612.14	1
5	632.46	1
5	657.86	1
5	683.26	1
5	716.28	1
5	751.84	1
5	797.56	1





DCP TEST DATA

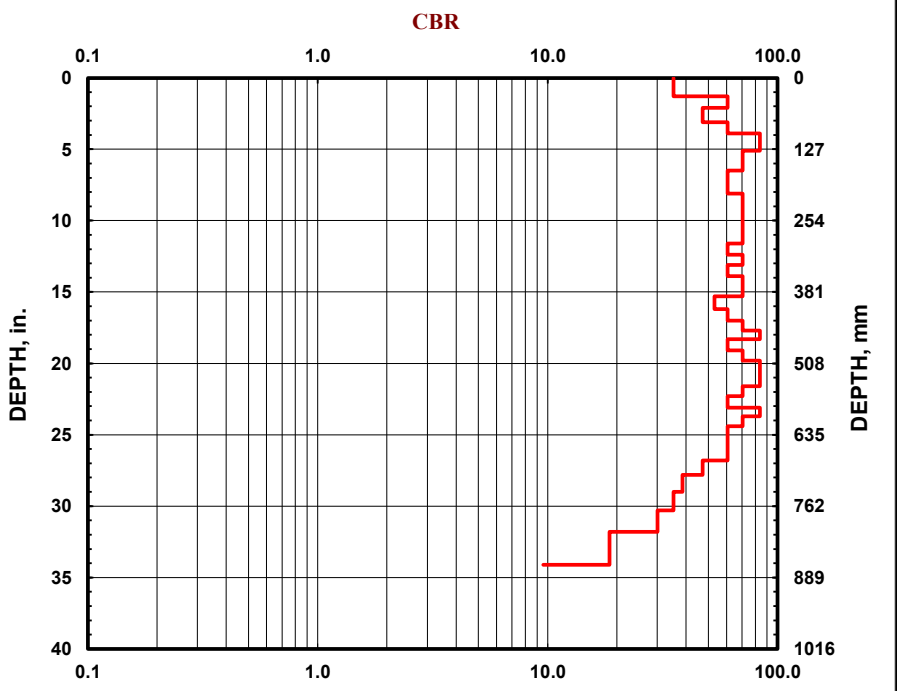
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

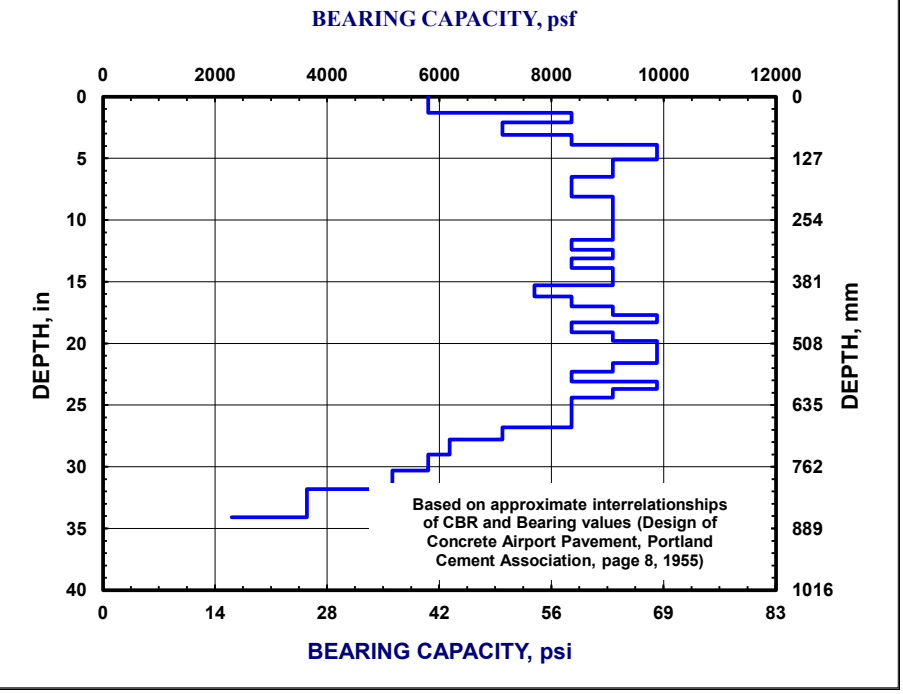
Location: R-10 **Soil Type(s):** SAND (SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	33.02	1
5	53.34	1
5	78.74	1
5	99.06	1
5	114.3	1
5	129.54	1
5	147.32	1
5	165.1	1
5	185.42	1
5	205.74	1
5	223.52	1
5	241.3	1
5	259.08	1
5	276.86	1
5	294.64	1
5	314.96	1
5	332.74	1
5	353.06	1
5	370.84	1
5	388.62	1
5	411.48	1
5	431.8	1
5	449.58	1
5	464.82	1
5	485.14	1
5	502.92	1
5	518.16	1
5	533.4	1
5	548.64	1
5	566.42	1
5	586.74	1
5	601.98	1
5	619.76	1
5	640.08	1
5	660.4	1
5	680.72	1
5	706.12	1
5	736.6	1
5	769.62	1
5	807.72	1
5	866.14	1
3	929.64	1





DCP TEST DATA

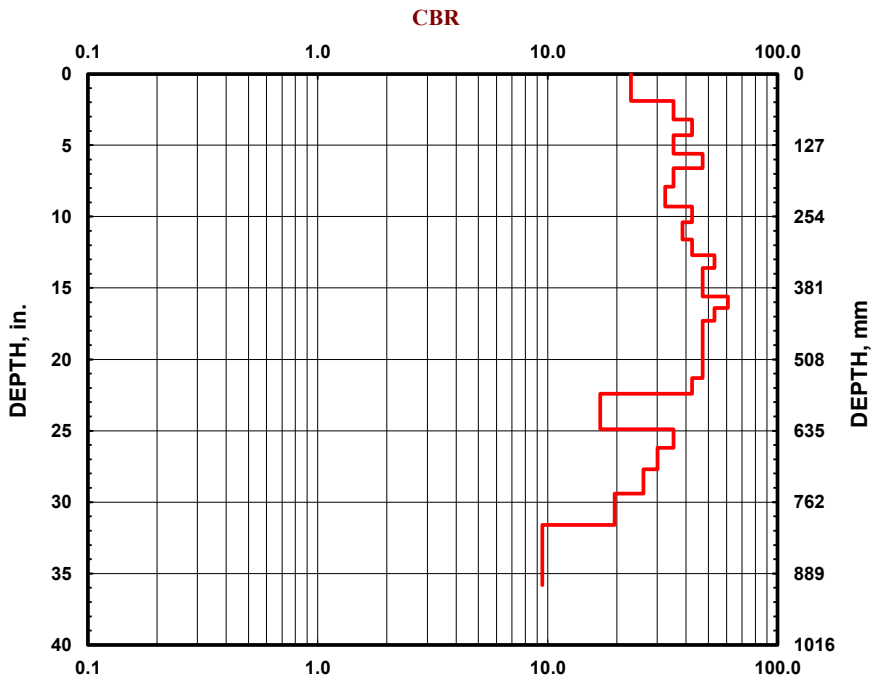
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

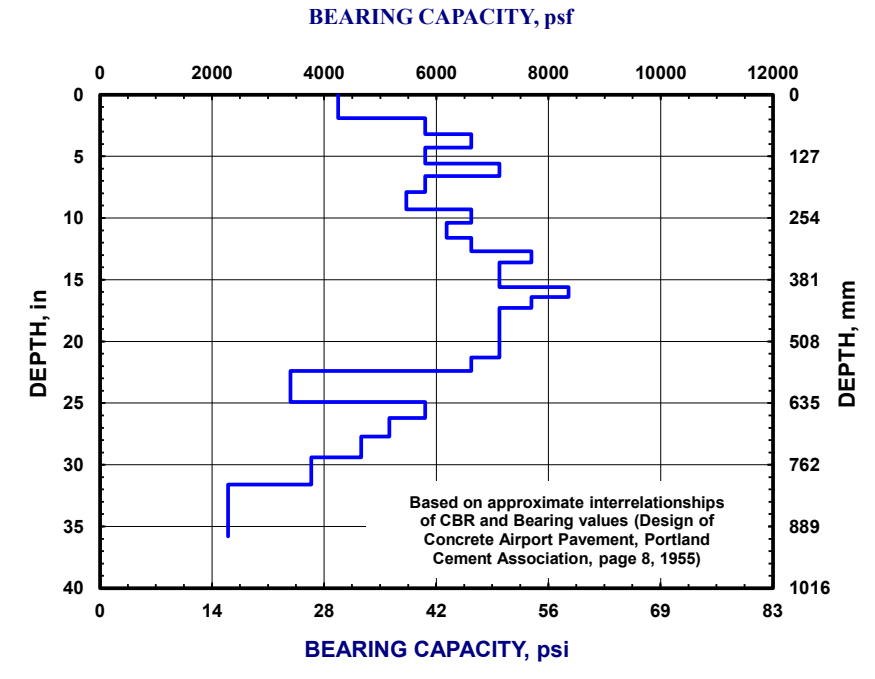
Location: R-11 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	48.26	1
5	81.28	1
5	109.22	1
5	142.24	1
5	167.64	1
5	200.66	1
5	236.22	1
5	264.16	1
5	294.64	1
5	322.58	1
5	345.44	1
5	370.84	1
5	396.24	1
5	416.56	1
5	439.42	1
5	464.82	1
5	490.22	1
5	515.62	1
5	541.02	1
5	568.96	1
5	632.46	1
5	665.48	1
5	703.58	1
5	746.76	1
5	802.64	1
5	909.32	1





DCP TEST DATA

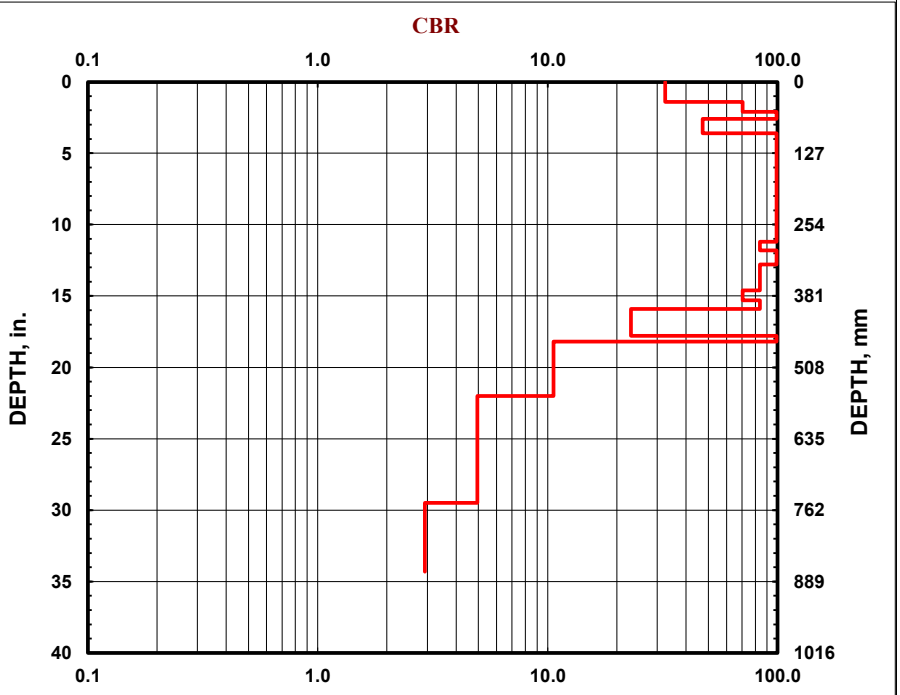
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

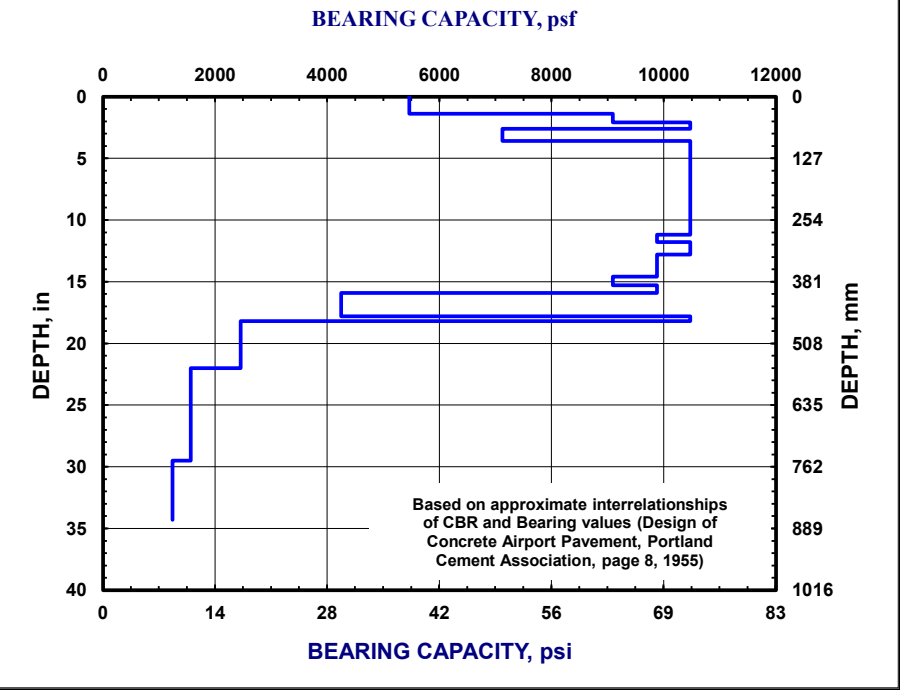
Location: R-12 **Soil Type(s):** SAND (SP-SM, SC)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	35.56	1
5	53.34	1
5	66.04	1
5	91.44	1
5	101.6	1
5	114.3	1
5	121.92	1
5	129.54	1
5	142.24	1
5	154.94	1
5	165.1	1
5	175.26	1
5	182.88	1
5	193.04	1
5	205.74	1
5	215.9	1
5	226.06	1
5	236.22	1
5	248.92	1
5	261.62	1
5	274.32	1
5	284.48	1
5	299.72	1
5	312.42	1
5	325.12	1
5	340.36	1
5	355.6	1
5	370.84	1
5	388.62	1
5	403.86	1
5	452.12	1
5	462.28	1
5	558.8	1
5	749.3	1
2	871.22	1





DCP TEST DATA

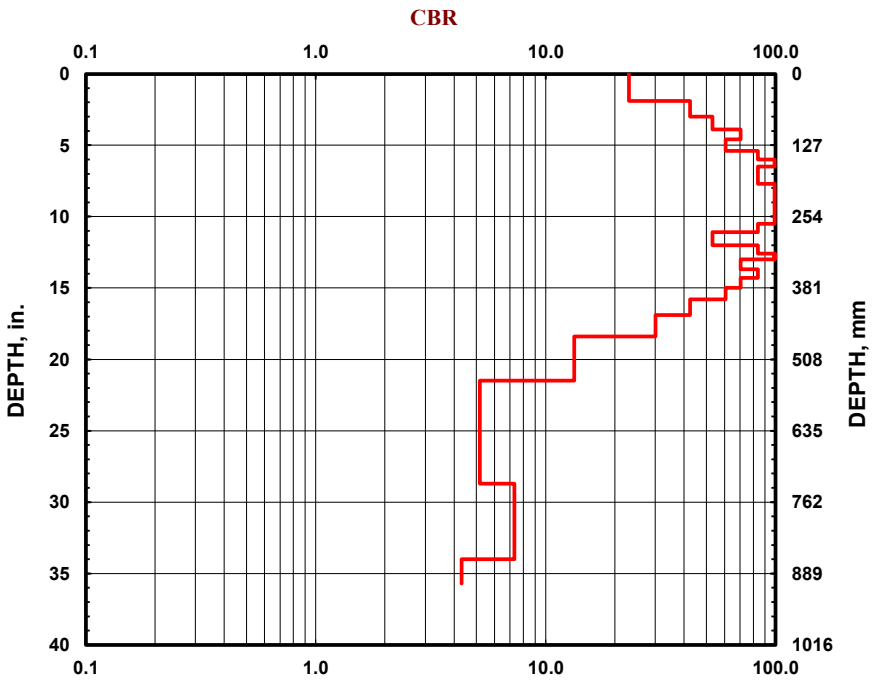
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

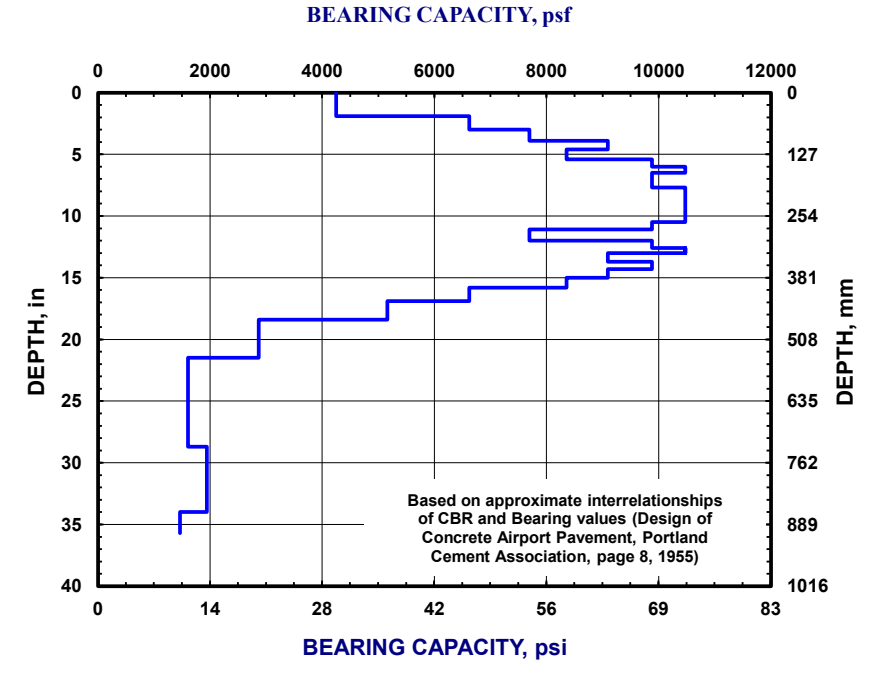
Location: R-13 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	48.26	1
5	76.2	1
5	99.06	1
5	116.84	1
5	137.16	1
5	152.4	1
5	165.1	1
5	180.34	1
5	195.58	1
5	208.28	1
5	220.98	1
5	233.68	1
5	246.38	1
5	259.08	1
5	266.7	1
5	281.94	1
5	304.8	1
5	320.04	1
5	330.2	1
5	320.04	1
5	330.2	1
5	347.98	1
5	363.22	1
5	381	1
5	401.32	1
5	429.26	1
5	467.36	1
5	546.1	1
5	728.98	1
5	863.6	1
1	906.78	1





DCP TEST DATA

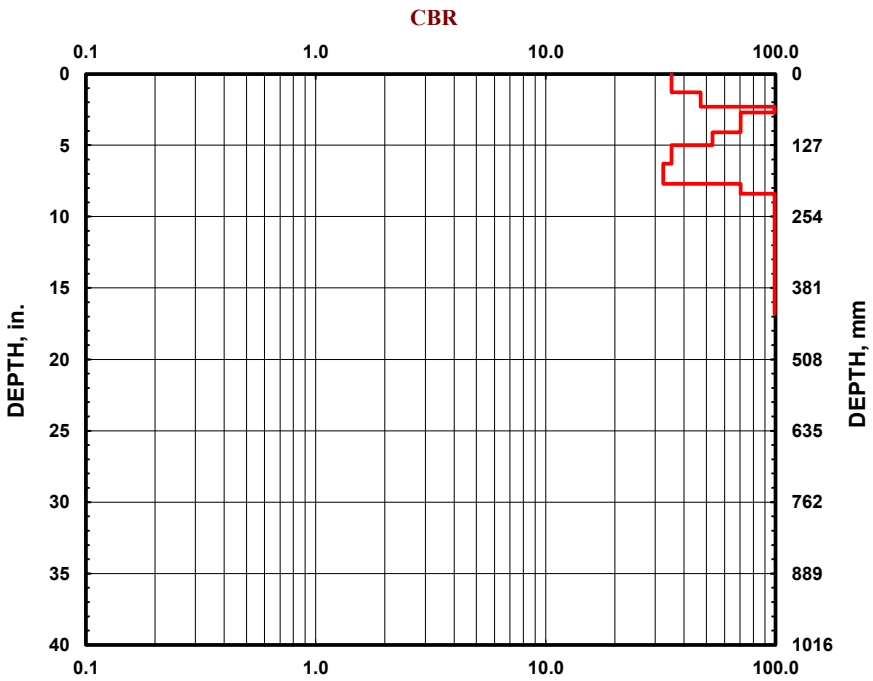
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 27-Jun-22

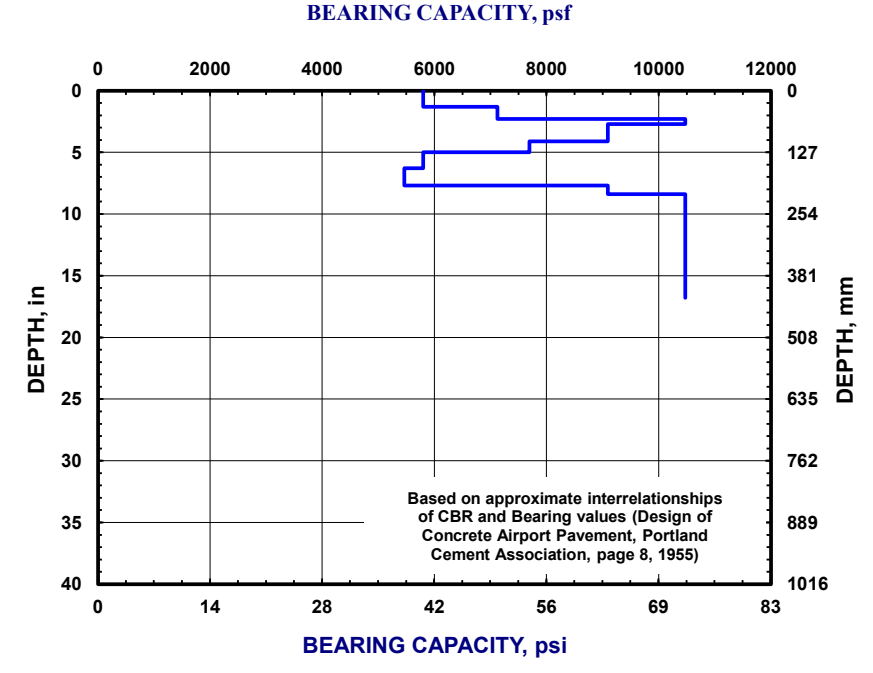
Location: R-14 **Soil Type(s):** SAND (SC, SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	33.02	1
5	58.42	1
5	68.58	1
5	86.36	1
5	104.14	1
5	127	1
5	160.02	1
5	195.58	1
5	213.36	1
5	223.52	1
5	228.6	1
5	236.22	1
5	248.92	1
5	256.54	1
5	261.62	1
5	264.16	1
5	269.24	1
5	274.32	1
5	279.4	1
5	287.02	1
5	289.56	1
5	294.64	1
5	299.72	1
5	302.26	1
5	307.34	1
5	312.42	1
5	317.5	1
5	322.58	1
5	327.66	1
5	337.82	1
5	342.9	1
5	350.52	1
5	355.6	1
5	363.22	1
5	370.84	1
5	375.92	1
5	388.62	1
5	398.78	1
5	408.94	1
5	419.1	1
5	426.72	1
5	434.34	1





DCP TEST DATA

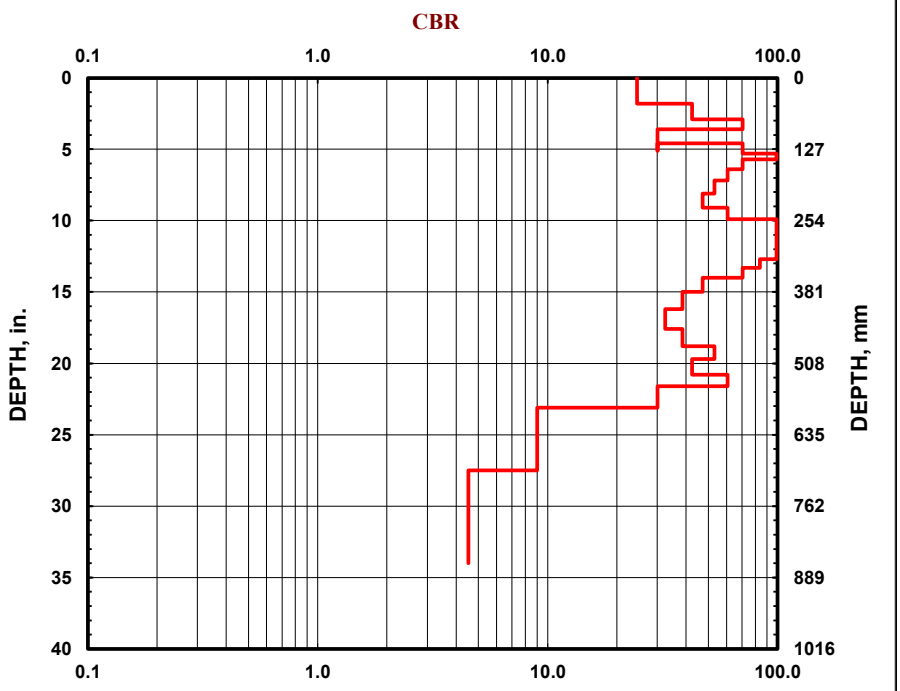
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 27-Jun-22

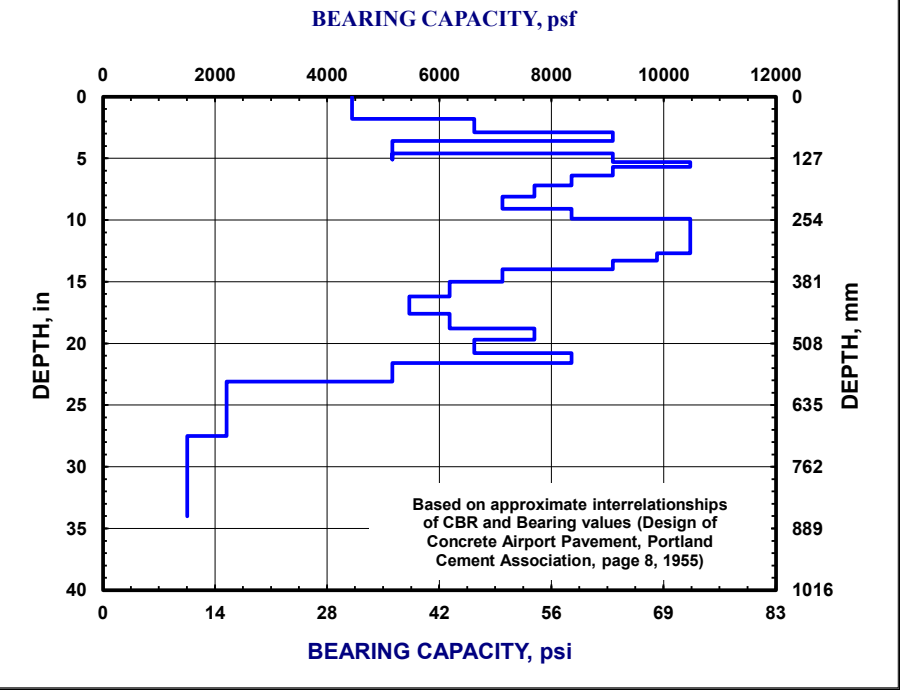
Location: R-15 **Soil Type(s):** SAND (SC)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	45.72	1
5	73.66	1
5	91.44	1
5	129.54	1
5	116.84	1
5	134.62	1
5	144.78	1
5	162.56	1
5	182.88	1
5	205.74	1
5	231.14	1
5	251.46	1
5	264.16	1
5	276.86	1
5	289.56	1
5	299.72	1
5	309.88	1
5	322.58	1
5	337.82	1
5	355.6	1
5	381	1
5	411.48	1
5	447.04	1
5	477.52	1
5	500.38	1
5	528.32	1
5	548.64	1
5	586.74	1
5	698.5	1
4	863.6	1





DCP TEST DATA

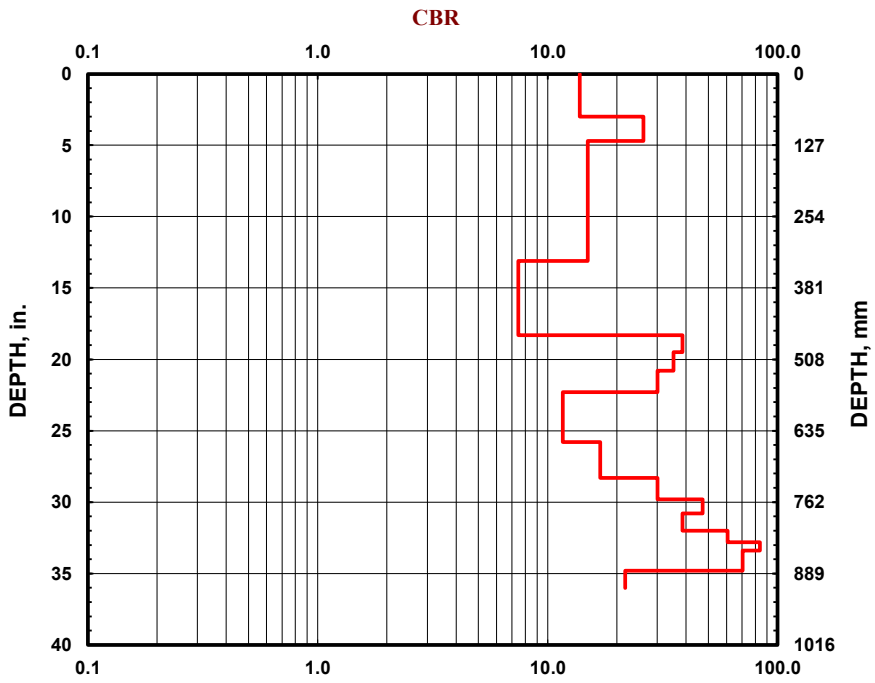
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 27-Jun-22

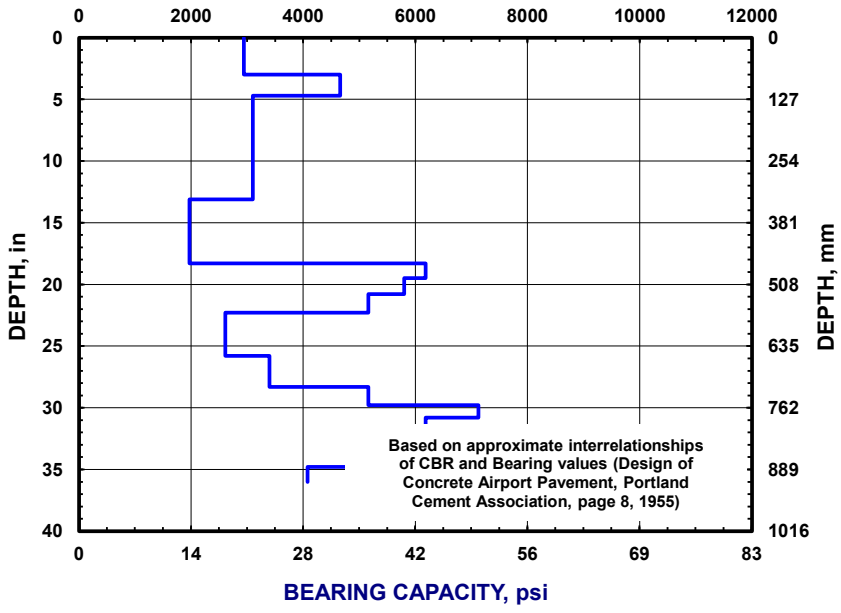
Location: R-16 **Soil Type(s):** SAND (SC, SC-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	76.2	1
5	119.38	1
5	190.5	1
5	261.62	1
5	332.74	1
5	464.82	1
5	495.3	1
5	528.32	1
5	566.42	1
5	655.32	1
5	718.82	1
5	756.92	1
5	782.32	1
5	812.8	1
5	833.12	1
5	848.36	1
5	866.14	1
5	883.92	1
3	914.4	1





DCP TEST DATA

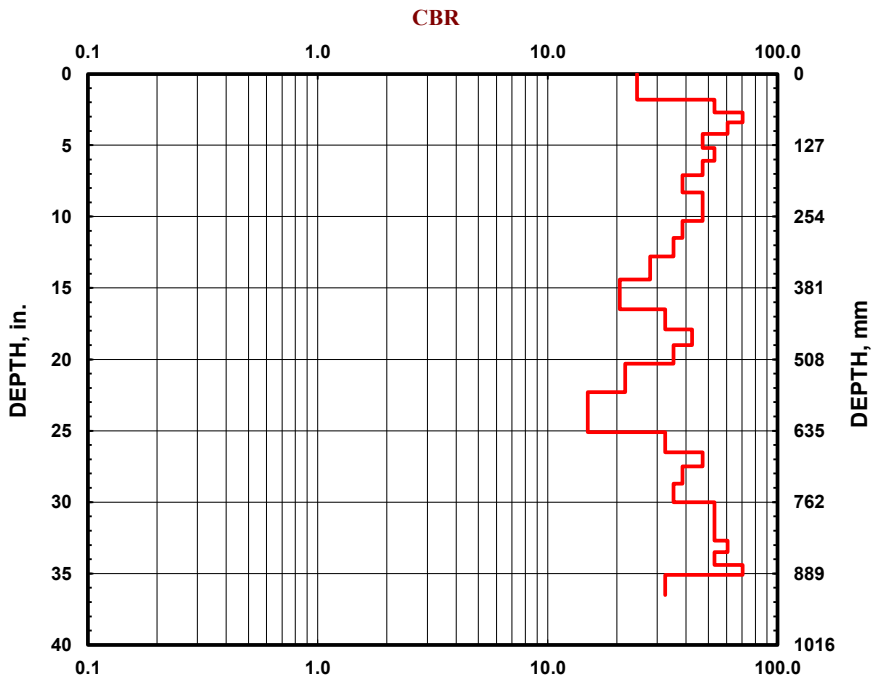
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 27-Jun-22

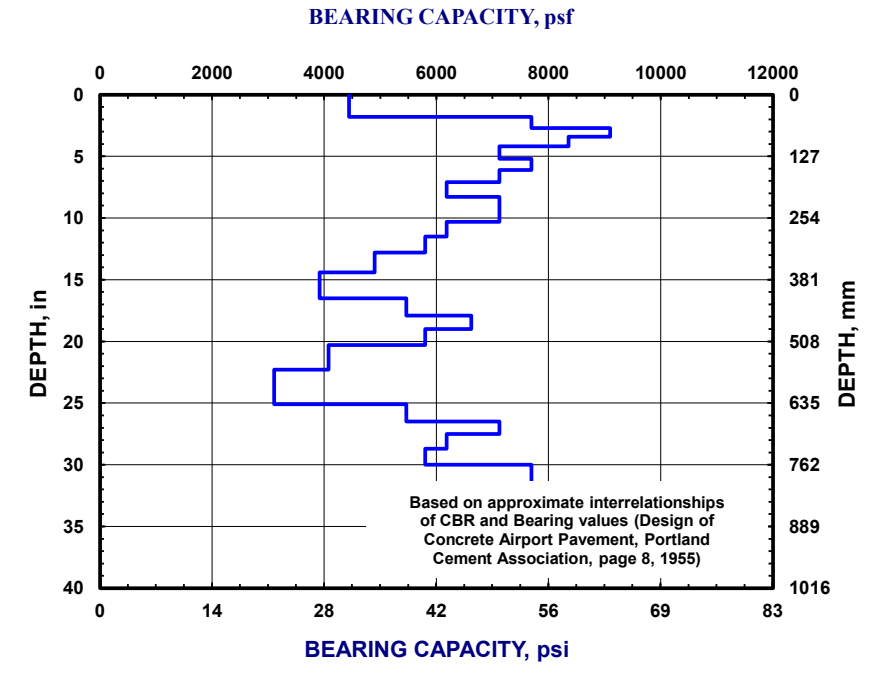
Location: R-17 **Soil Type(s):** SAND (SC, SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	45.72	1
5	68.58	1
5	86.36	1
5	106.68	1
5	132.08	1
5	154.94	1
5	180.34	1
5	210.82	1
5	236.22	1
5	261.62	1
5	292.1	1
5	325.12	1
5	365.76	1
5	419.1	1
5	454.66	1
5	482.6	1
5	515.62	1
5	566.42	1
5	637.54	1
5	673.1	1
5	698.5	1
5	728.98	1
5	762	1
5	784.86	1
5	807.72	1
5	830.58	1
5	850.9	1
5	873.76	1
5	891.54	1
5	927.1	1





DCP TEST DATA

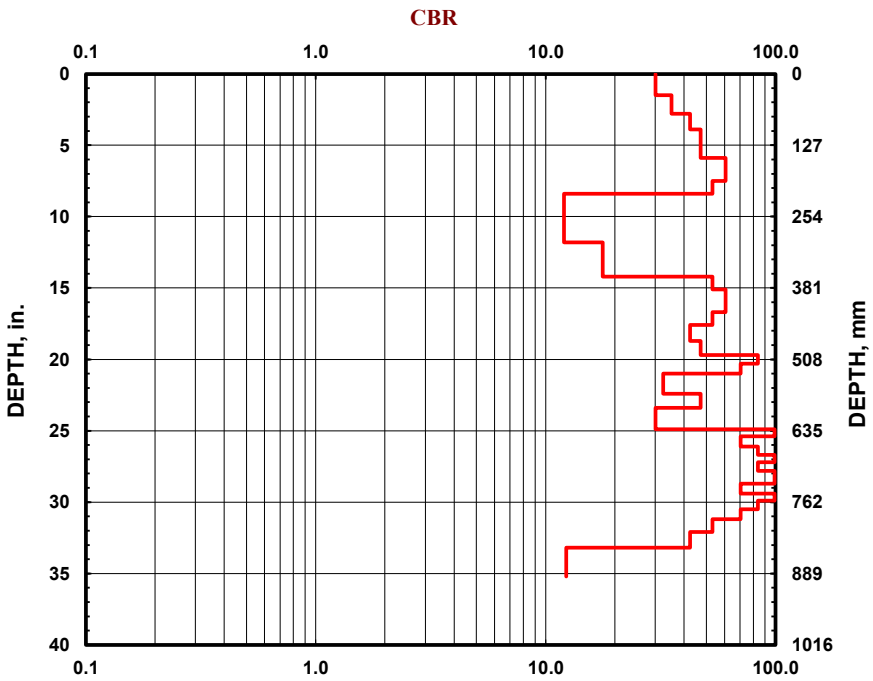
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

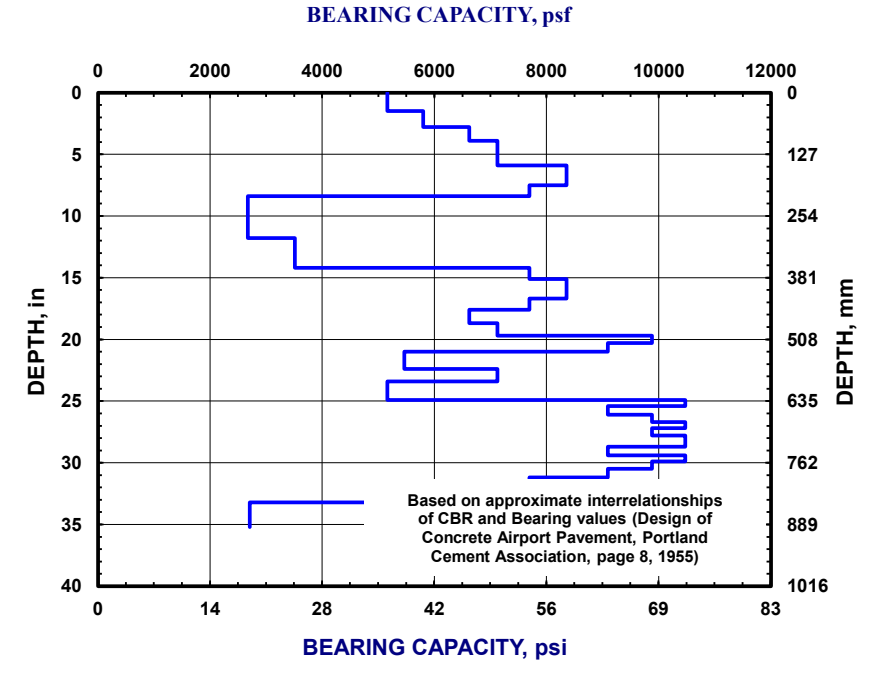
Location: T-01 **Soil Type(s):** SAND (SP-SM, SP, SC)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	38.1	1
5	71.12	1
5	99.06	1
5	124.46	1
5	149.86	1
5	170.18	1
5	190.5	1
5	213.36	1
5	299.72	1
5	360.68	1
5	383.54	1
5	403.86	1
5	424.18	1
5	447.04	1
5	474.98	1
5	500.38	1
5	515.62	1
5	533.4	1
5	568.96	1
5	594.36	1
5	632.46	1
5	645.16	1
5	662.94	1
5	678.18	1
5	690.88	1
5	706.12	1
5	716.28	1
5	728.98	1
5	746.76	1
5	759.46	1
5	774.7	1
5	792.48	1
5	815.34	1
5	843.28	1
3	894.08	1





DCP TEST DATA

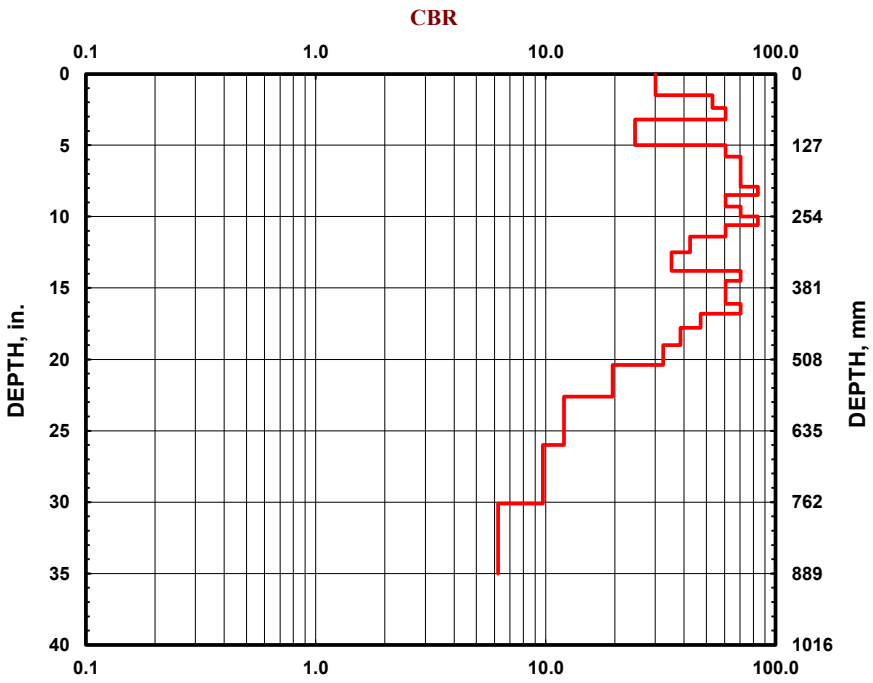
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 24-Jun-22

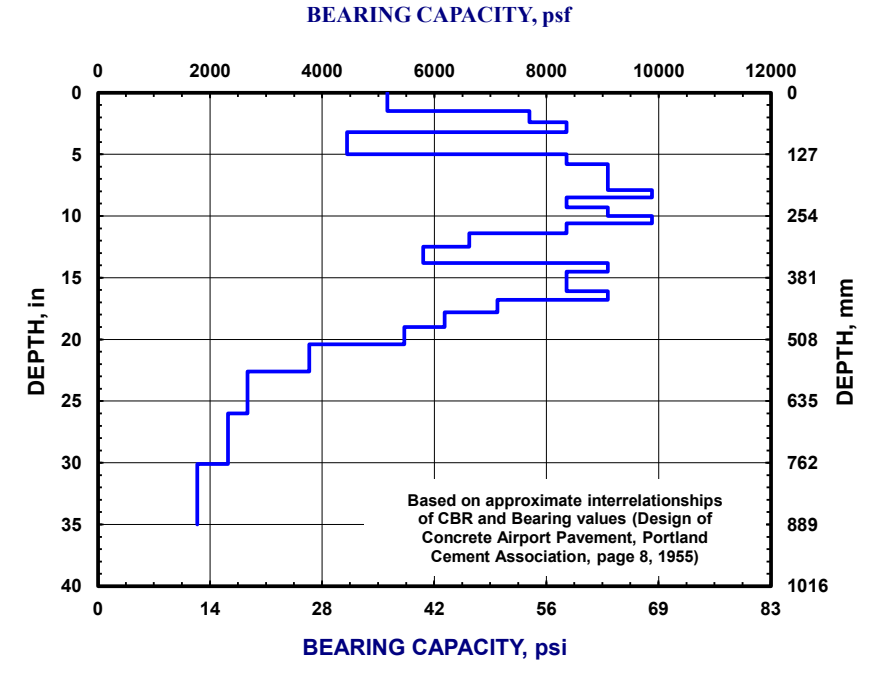
Location: T-02 **Soil Type(s):** SAND (SM, SC)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	38.1	1
5	60.96	1
5	81.28	1
5	127	1
5	147.32	1
5	165.1	1
5	182.88	1
5	200.66	1
5	215.9	1
5	236.22	1
5	254	1
5	269.24	1
5	289.56	1
5	317.5	1
5	350.52	1
5	368.3	1
5	388.62	1
5	408.94	1
5	426.72	1
5	452.12	1
5	482.6	1
5	518.16	1
5	574.04	1
5	660.4	1
5	764.54	1
4	889	1





DCP TEST DATA

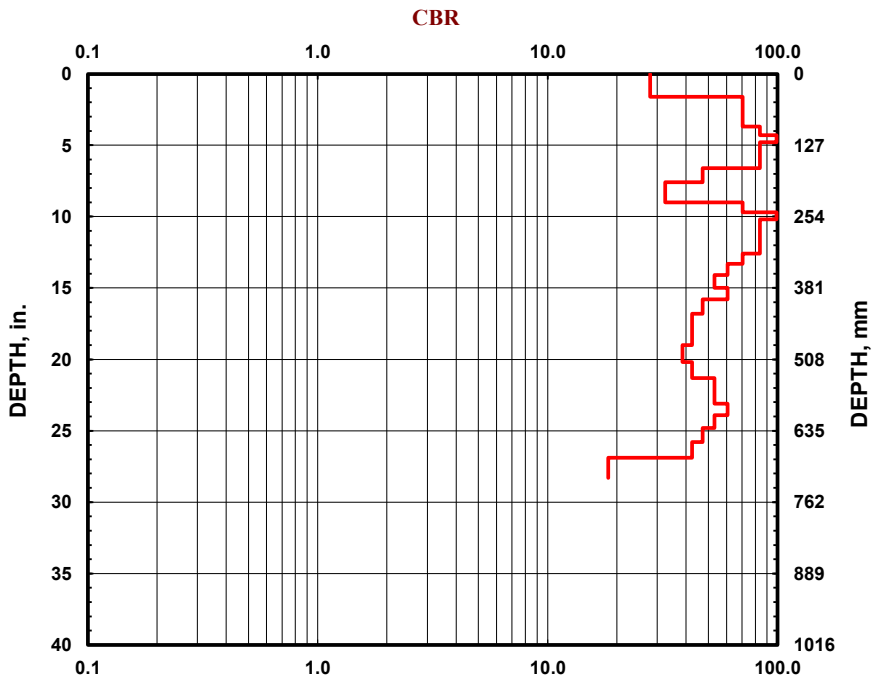
Project: *33:5931 Elizabethtown Runway Pavement Rehab* **Date:** 22-Jun-22

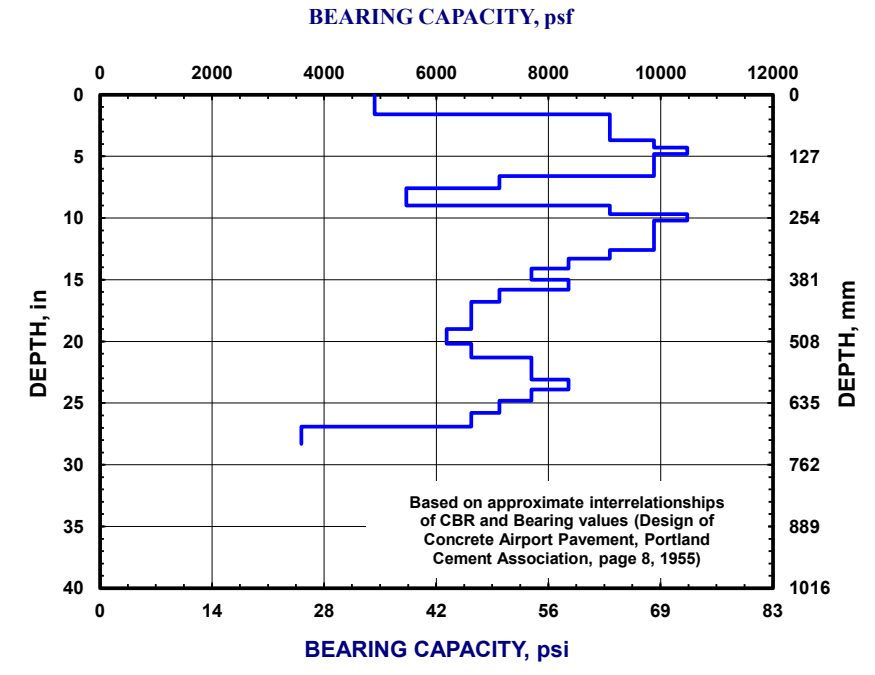
Location: T-03 **Soil Type(s):** SAND (SM, SP-SM)

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
5	40.64	1
5	58.42	1
5	76.2	1
5	93.98	1
5	109.22	1
5	121.92	1
5	137.16	1
5	152.4	1
5	167.64	1
5	193.04	1
5	228.6	1
5	246.38	1
5	259.08	1
5	274.32	1
5	289.56	1
5	304.8	1
5	320.04	1
5	337.82	1
5	358.14	1
5	381	1
5	401.32	1
5	426.72	1
5	454.66	1
5	482.6	1
5	513.08	1
5	541.02	1
5	563.88	1
5	586.74	1
5	607.06	1
5	629.92	1
5	655.32	1
5	683.26	1
3	718.82	1





CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-01**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Concrete Thickness[4.25"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, tan, moist			S-1		
						S-2		
						S-3		
			(SP) FINE TO MEDIUM SAND, orange to tan, moist			S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-02**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Concrete Thickness[5.50"]					
			ABC Stone Thickness[5.50"]					
			(SP-SM) SAND WITH SILT, yellowish tan, moist			S-1		
			(SM) SILTY SAND, orange and tan, moist			S-2		
						S-3		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, orange and tan, moist			S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-03**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.25"]					
			ABC Stone Thickness[8.75"]			S-1		
			(SP) FINE TO MEDIUM SAND, tannish brown, moist			S-2		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish tan, moist			S-3		
						S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-04**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.25"]					
			ABC Stone Thickness[8.75"]			S-1		
			(SM) SILTY FINE TO MEDIUM SAND, tan to brown, moist			S-2	16	7.2
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish tan, moist			S-3		
						S-4		
			(SM) SILTY FINE TO MEDIUM SAND, orangish tan, moist					
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-05**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[1.75"]					
			ABC Stone Thickness[6.00"]					
			(SP-SM) SAND WITH SILT, light gray, moist			S-1		
						S-2		
			(SM) SILTY FINE TO MEDIUM SAND, orangish tan, moist			S-3		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, orangish tan, moist			S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**A-06**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.75"]					
			ABC Stone Thickness[9.75"]			S-1		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish tan, moist			S-2		
						S-3		
			(SM) SILTY FINE TO MEDIUM SAND, orangish brown, moist					
						S-4		
			(SP) FINE TO MEDIUM SAND, yellowish orange, moist					
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-01**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[2.00"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, contains slight roots, tan, moist		6-8-7	S-1		
					6-7-6	S-2		
			(SM) SILTY FINE TO MEDIUM SAND, yellowish tan to brown, moist		6-5-4	S-3		
					5-6-8	S-4		
5					5-6-8	S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 28 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-02**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[2.00"]					
			(SM) SILTY FINE TO MEDIUM SAND, contains slight roots, yellowish brown, moist		7-14-13	S-1	19	6.7
			(SM) SILTY FINE TO MEDIUM SAND, yellowish tan to gray, moist		11-16-16	S-2		
					9-9-9	S-3		
					9-9-8	S-4		
5					9-8-7	S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 28 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-03**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[4.00"]					
			(SM) SILTY SAND, gray to tan, moist		5-5-10	S-1		
			(SC) CLAYEY FINE TO MEDIUM SAND, contains slight roots, tan, moist		17-25	S-2		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, contains slight roots, dark gray and tan, moist		8-25	S-3		
					25	S-4		
5					25	S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-04**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[4.00"]					
			(SM) SILTY FINE TO MEDIUM SAND, contains slight roots, dark brown to gray, moist		7-5-9	S-1		
					6-7-10	S-2		
					5-7-16	S-3		
			(SC) CLAYEY FINE TO MEDIUM SAND, tan to orangish brown, moist		25	S-4		
5					9-18-22	S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-05**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[2.00"]					
			(SC-SM) CLAYEY SILTY FINE TO MEDIUM SAND, contains slight roots, orangish brown, moist		5-8-10	S-1	18	8.9
					8-25	S-2		
			(SC) CLAYEY FINE TO MEDIUM SAND, mottled tannish orange to light gray, moist		13-8-8	S-3		
					9-10-12	S-4		
5					13-17-25	S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-06**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[4.00"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish tan, moist		6-6-5	S-1		
					7-18-17	S-2		
			(SM) SILTY FINE TO MEDIUM SAND, contains slight roots, tan to grayish brown, moist		8-8-7	S-3		
			(SC) CLAYEY FINE TO MEDIUM SAND, yellowish tan, moist		8-15-19	S-4		
					25	S-5		
5			**END OF HAND AUGER AT 5 FT**					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-07**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[2.00"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, contains slight roots, grayish brown to yellowish tan, moist		4-6-8	S-1		
					25	S-2		
					10-18-18	S-3		
					11-14-15	S-4		
5			**END OF HAND AUGER AT 5 FT**		6-7-9	S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 28 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**D-08**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Topsoil Thickness[2.00"]					
			(SP) FINE TO MEDIUM SAND, contains slight roots, yellowish tan to gray, moist		4-7-9	S-1		
					6-19-15	S-2		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, contains slight roots, yellowish tan to gray, moist		6-6-6	S-3		
			(SC) CLAYEY SAND, orangish brown, moist		7-6-7	S-4		
					11-14-15	S-5		
5			**END OF HAND AUGER AT 5 FT**					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 28 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-01**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[6.00"]					
			(SM) SILTY FINE TO MEDIUM SAND, yellowish tan, moist			S-1		
						S-2	12	6.8
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish tan, moist			S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-02**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[8.50"]					
			(SC FILL) FILL, CLAYEY FINE TO MEDIUM SAND, tan, moist			S-1		
			(SM) SILTY FINE TO MEDIUM SAND, yellowish tan, moist			S-2		
						S-3		
						S-4		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, tan, moist					
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-03**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[7.25"]					
			(SP-SM FILL) FILL, FINE TO MEDIUM SAND WITH SILT, tan, moist			S-1 S-2		
			(SM) SILTY FINE TO MEDIUM SAND, tan to orange, moist			S-3 S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-04**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[7.00"]					
			(SP-SM FILL) FILL, FINE TO MEDIUM SAND WITH SILT, brown, moist			S-1		
						S-2	11	4.9
			(SM) SILTY FINE TO MEDIUM SAND, orangish brown, moist			S-3		
						S-4		
			(SC) CLAYEY FINE TO MEDIUM SAND, orange, moist					
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-05**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[6.00"]					
			(SM FILL) FILL, SILTY FINE TO MEDIUM SAND, yellowish brown, moist			S-1		
			(SM) SILTY FINE TO MEDIUM SAND, yellow to orange, moist			S-2		
						S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-06**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.25"]					
			ABC Stone Thickness[7.25"]					
			(SC FILL) FILL, CLAYEY FINE TO MEDIUM SAND, orange to brown, moist			S-1		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellow and orangish brown, moist			S-2 S-3		
			(SC) CLAYEY SAND, orange, moist			S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-07**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[11.00"]			S-1		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, brown, moist			S-2	9	5.3
						S-3		
			(SC) CLAYEY FINE TO MEDIUM SAND, orange to brown, moist			S-4		
			(SP) FINE TO MEDIUM SAND, orange, moist			S-5		
5			**END OF HAND AUGER AT 5 FT**					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 23 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-08**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[5.50"]					
			(SM) SILTY FINE TO MEDIUM SAND, dark brown to tannish orange, moist			S-1		
						S-2		
						S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-09**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[7.50"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish brown, moist			S-1 S-2		
			(SM) SILTY FINE TO MEDIUM SAND, tan, moist			S-3 S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-10**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[6.50"]					
			(SM FILL) FILL, SILTY FINE TO MEDIUM SAND, orange to brown, moist			S-1		
						S-2	16	8.8
			(SM) SILTY FINE TO MEDIUM SAND, orangish brown and tan, moist			S-3		
						S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-11**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[6.75"]					
			(SM FILL) FILL, SILTY FINE TO MEDIUM SAND, brown and orange, moist			S-1		
						S-2		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, yellowish brown, moist			S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-12**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[8.50"]					
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, tan, moist			S-1		
						S-2		
			(SC) CLAYEY FINE TO MEDIUM SAND, orangish tan, moist			S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-13**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.50"]					
			ABC Stone Thickness[7.00"]					
			(SP-SM FILL) FILL, FINE TO MEDIUM SAND WITH SILT, contains slight rock fragments, dark gray, moist			S-1		
			(SM) SILTY FINE TO MEDIUM SAND, brown and orange, moist			S-2		
						S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-14**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.25"]					
			ABC Stone Thickness[7.50"]					
			(SC) CLAYEY FINE TO MEDIUM SAND, dark brown, moist			S-1		
						S-2	28	8.1
			(SM) SILTY FINE TO MEDIUM SAND, brown, moist			S-3		
						S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-15**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[7.50"]					
			(SC FILL) FILL, CLAYEY FINE TO MEDIUM SAND, tan, moist			S-1		
						S-2		
			(SC) CLAYEY FINE TO MEDIUM SAND, orange and brown, moist			S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-16**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.75"]					
			ABC Stone Thickness[6.75"]					
			(SC-SM) CLAYEY SILTY FINE TO MEDIUM SAND, tannish orange, moist			S-1		
	▽					S-2	25	12.2
			(SC) CLAYEY FINE TO MEDIUM SAND, tan to brown, wet			S-3		
						S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **2.50**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**R-17**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[6.75"]					
			(SM FILL) FILL, SILTY FINE TO MEDIUM SAND, tan, moist			S-1		
						S-2		
			(SC) CLAYEY FINE TO MEDIUM SAND, orange, moist			S-3	23	10.6
						S-4		
			(SM) SILTY FINE TO MEDIUM SAND, tan, moist					
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 27 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**T-01**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[8.50"]					
			(SP) FINE TO MEDIUM SAND, tan, moist			S-1		
			(SP-SM) FINE TO MEDIUM SAND WITH SILT, tan, moist			S-2		
			(SC) CLAYEY FINE TO MEDIUM SAND, orange to brown, moist			S-3		
						S-4		
5			**END OF HAND AUGER AT 5 FT**			S-5		
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

WL (First Encountered) **NE**	WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**T-02**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[3.50"]					
			ABC Stone Thickness[5.50"]					
			(SM) SILTY FINE TO MEDIUM SAND, yellowish tan to brown, moist			S-1		
						S-2		
						S-3		
			(SC) CLAYEY FINE TO MEDIUM SAND, reddish orange, moist			S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 24 2022**	**English**	

HAND AUGER LOG

CLIENT:	PROJECT NO.:	SHEET:
WK Dickson & Co., Inc.	**33:5931**	**1 of 1**
PROJECT NAME:	HAND AUGER NO.:	SURFACE ELEVATION:
Elizabethtown Runway Pavement Rehab	**T-03**	
SITE LOCATION:		STATION:
466 Airport Rd, Elizabethtown, North Carolina 28337		
NORTHING:	EASTING:	

DEPTH (FT)	WATER LEVELS	ELEVATION (FT)	DESCRIPTION OF MATERIAL	EXCAVATION EFFORT	DCP	SAMPLE NUMBER	FINES CONTENT (%)	MOISTURE CONTENT (%)
			Asphalt Thickness[4.00"]					
			ABC Stone Thickness[10.00"]			S-1		
			(SP-SM FILL) FILL, FINE TO MEDIUM SAND WITH SILT, contains slight rock fragments, tan to brown, moist			S-2		
						S-3		
			(SM) SILTY FINE TO MEDIUM SAND, tan to dark brown, moist			S-4		
5						S-5		
			END OF HAND AUGER AT 5 FT					
10								
15								

REMARKS:

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

▽ WL (First Encountered) **NE**	▼ WL (Seasonal High)	ECS REP:	DATE COMPLETED:	UNITS:	CAVE-IN-DEPTH:
▼ WL (Completion)		**AW, GB, CH**	**Jun 22 2022**	**English**	

HAND AUGER LOG

ECS Southeast, LLP 6151 Raeford Road, Suite A Fayetteville, NC 28304 Phone: 910.401.3288	**PHOTO LOG**

Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 1: Core at A-01 *(Core oriented with concrete surface to the left)*

Photo 2: Core at A-02 *(Core oriented with concrete surface to the left)*

Photo 3: Core at A-03 *(Core oriented with asphalt surface to the left)*

ECS Southeast, LLP 6151 Raeford Road, Suite A Fayetteville, NC 28304 Phone: 910.401.3288	**PHOTO LOG**

Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 4: Core at A-04 *(Core oriented with asphalt surface to the left)*

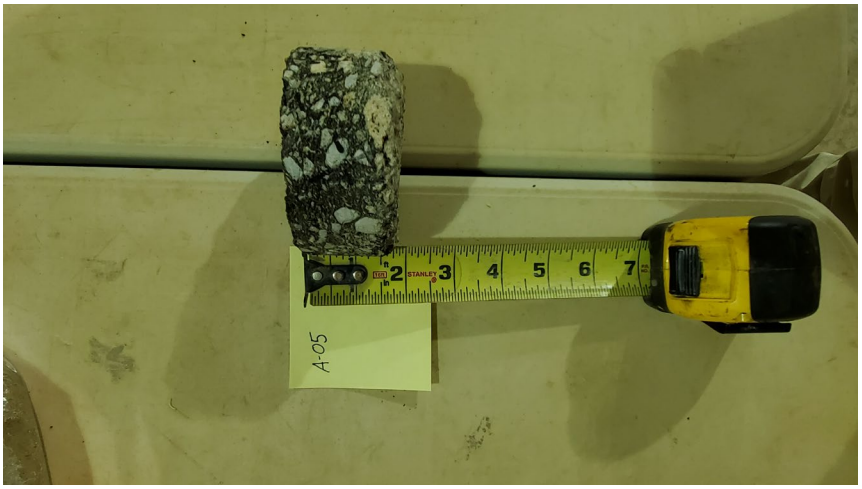


Photo 5: Core at A-05 *(Core oriented with asphalt surface to the left)*

Photo 6: Core at A-06 *(Core oriented with asphalt surface to the left)*

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 7: Core at R-01 *(Core oriented with asphalt surface to the left)*

Photo 8: Core at R-02 *(Core oriented with asphalt surface to the left)*

Photo 9: Core at R-03 *(Core oriented with asphalt surface to the left)*

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Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

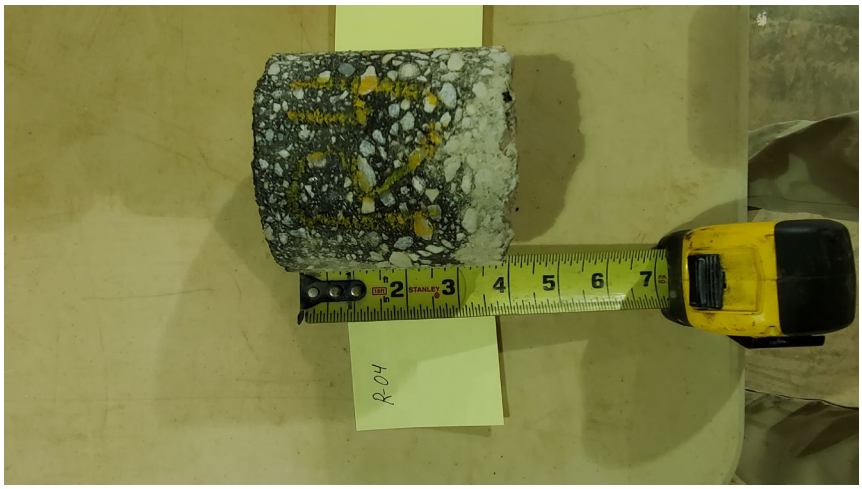

Photo 10: Core at R-04 *(Core oriented with asphalt surface to the left)*

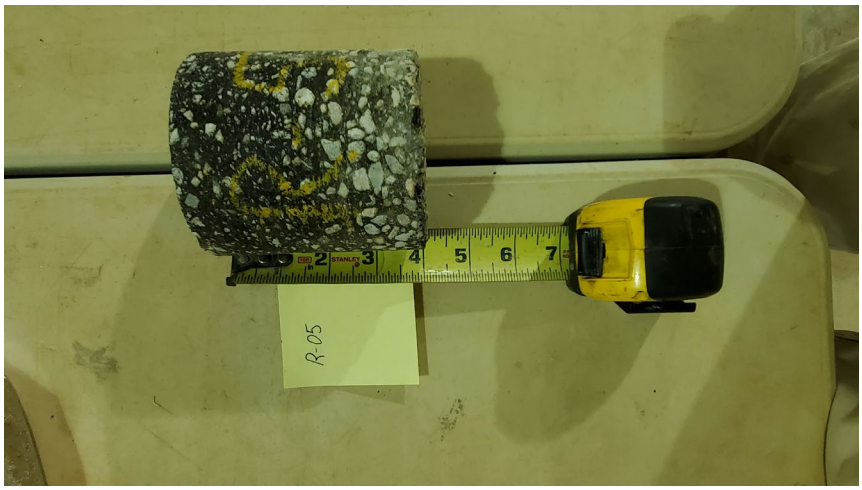

Photo 11: Core at R-05 *(Core oriented with asphalt surface to the left)*

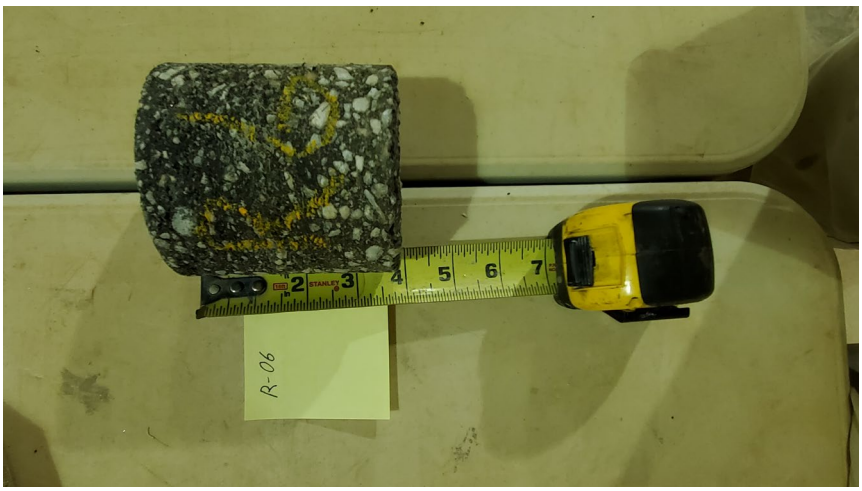

Photo 12: Core at R-06 *(Core oriented with asphalt surface to the left)*

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 13: Core at R-07 *(Core oriented with asphalt surface to the left)*

Photo 14: Core at R-08 *(Core oriented with asphalt surface to the left)*

Photo 15: Core at R-09 *(Core oriented with asphalt surface to the left)*

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 16: Core at R-10 *(Core oriented with asphalt surface to the left)*

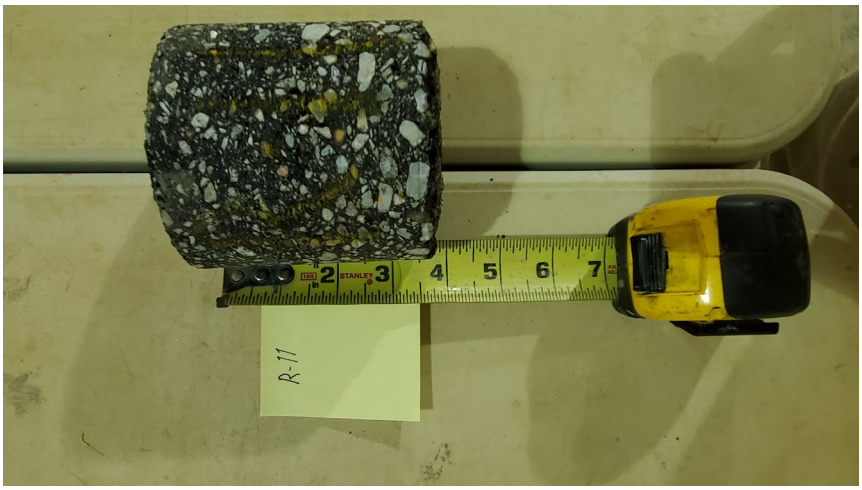

Photo 17: Core at R-11 *(Core oriented with asphalt surface to the left)*

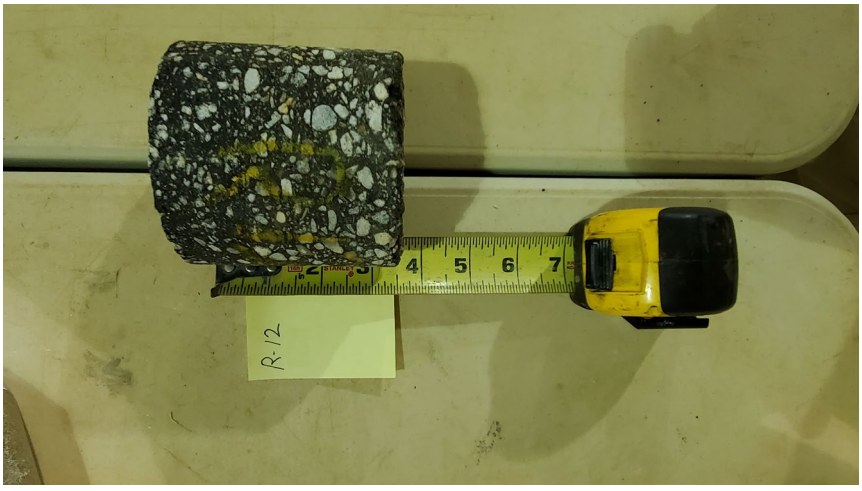

Photo 18: Core at R-12 *(Core oriented with asphalt surface to the left)*

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Phone: 910.401.3288

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 19: Core at R-13 *(Core oriented with asphalt surface to the left)*

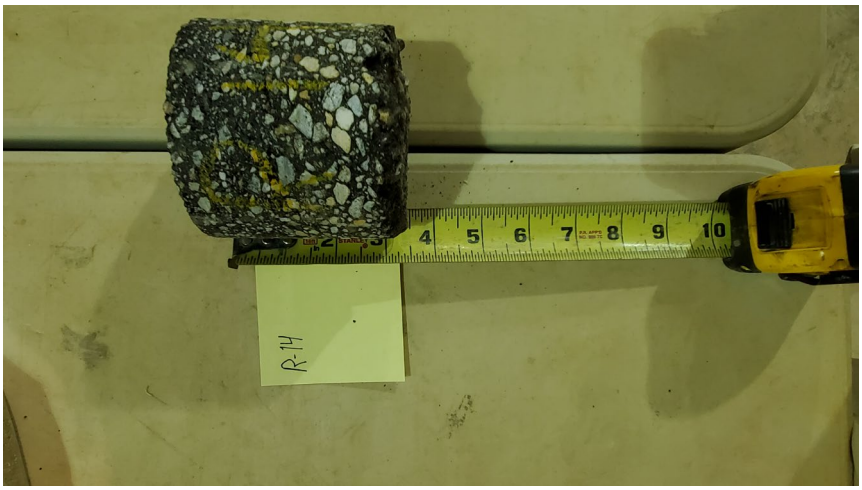

Photo 20: Core at R-14 *(Core oriented with asphalt surface to the left)*

Photo 21: Core at R-15 *(Core oriented with asphalt surface to the left)*

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 22: Core at R-16 *(Core oriented with asphalt surface to the left)*

Photo 23: Core at R-17 *(Core oriented with asphalt surface to the left)*

Photo 24: Core at T-01 *(Core oriented with asphalt surface to the left)*

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Project Name: Elizabethtown Runway Pavement Rehab	**Project Number:** 33:5931
Project Location: Elizabethtown, North Carolina	**Date:** 8/02/2022

Photo 25: Core at T-02 *(Core oriented with asphalt surface to the left)*

Photo 26: Core at T-03 *(Core oriented with asphalt surface to the left)*

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary
Moisture-Density Relationship Curves
CBR Test Results

Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
A-04	S-2	2-3	7.2	SM	NP	NP	NP	15.8					
D-02	S-1	0-1	6.7	SM	NP	NP	NP	19.3					
D-05	S-1	0-1	8.9	SC-SM	19	13	6	17.5					
R-01	S-2	1-2	6.8	SM	NP	NP	NP	12.1					
R-04	S-2	1-2	4.9	SP-SM	NP	NP	NP	11.3					
R-07	S-2	1-2	5.3	SP-SM	NP	NP	NP	9.3					
R-10	S-2	1-2	8.8	SM	NP	NP	NP	16.4					
R-14	S-2	1-2	8.1	SC	21	11	10	28.4					
R-16	S-2	1-2	12.2	SC-SM	18	12	6	24.5					
R-17	S-3	2-3	10.6	SC	20	12	8	22.7					

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.

Project No.: 33:5931
Date Reported:

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. □ Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received
BCook1	CMcDaniel	CMcDaniel	

Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
Composite Bulk Sample	BS-1	1-3	5.7	SP-SM	NP	NP	NP	9.4	109.9	8.8	13.8	15.5	
Composite Bulk Sample	BS-2	1-5	13.1	SC	25	12	13	28.7	116.5	12.2	12.5	14.1	

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

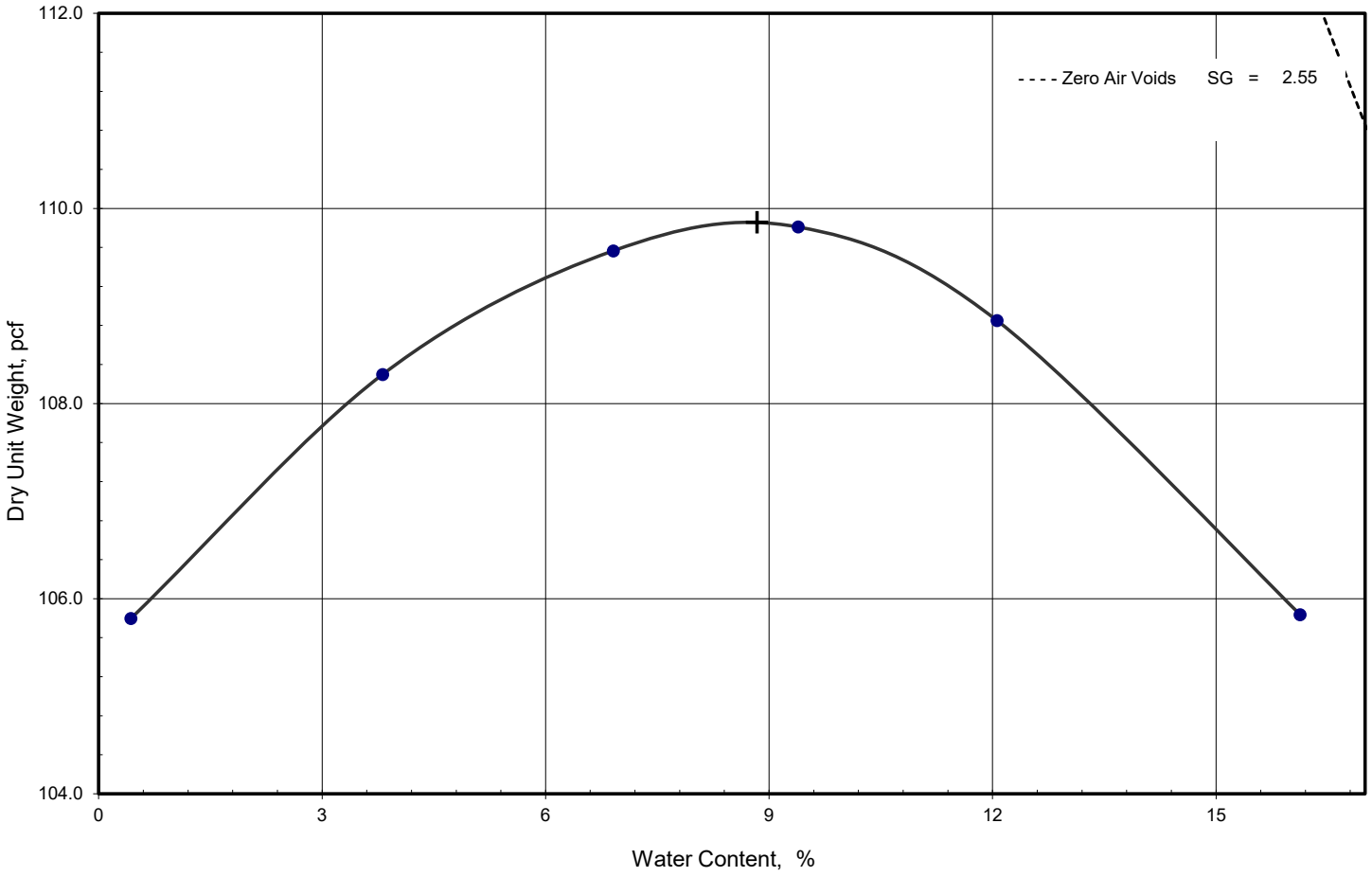
Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.

Project No.: 33:5931
Date Reported:

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received
BCook1	CMcDaniel	CMcDaniel	

Laboratory Compaction Characteristics of Soil
Using Standard Effort



Optimum Moisture Content		**8.8**	%
Maximum Dry Unit Weight		**109.9**	pcf
Cumulative material retained on:	3/4 in. sieve	0.1	%
	3/8 in. sieve	0.2	%
	#4 sieve	0.3	%

Preparation	ASTM dry preparation method	
Type of rammer	Mechanical - circular face	
Test Specfication / Method	ASTM D698-12e2-method A	
Specific gravity - D854 water pycnometer	2.55	Historical
Coarse Aggregate Specific Gravity -	2.60	

Soil Description	Nat. Moist. %	Liquid Limit	Plasticity Index	%< #200	USCS	AASHTO
SAND with Silt (SP-SM)	5.7	NP	NP	9.4		

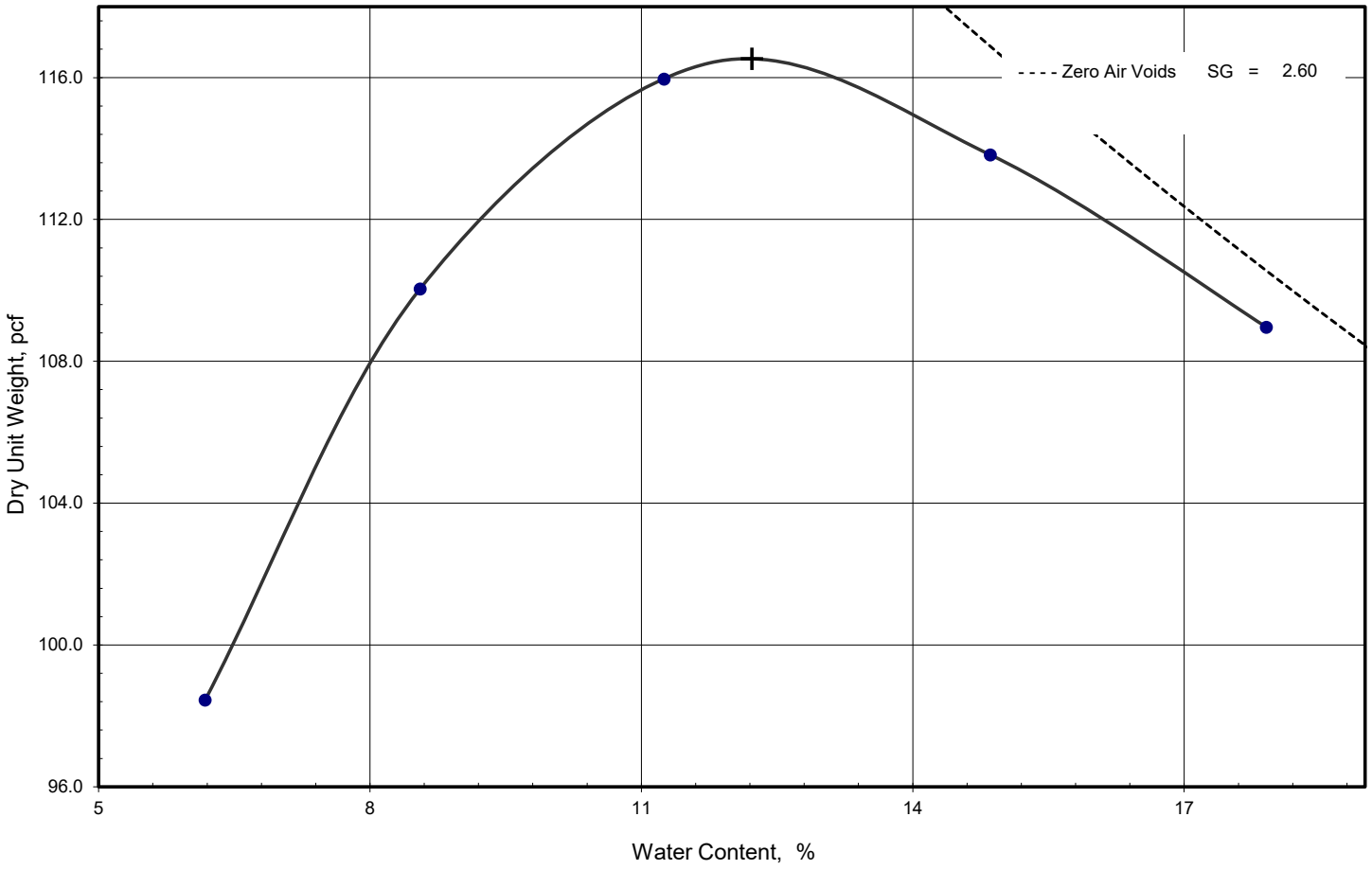
Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.
Sample / Source Composite Bulk Sample
Test Reference/No.:

Project No.: 33:5931
Depth (ft.): 1-3
Sample No.: BS-1
Date Reported:

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received	Remarks
Acreech	CMcDaniel	CMcDaniel		

Laboratory Compaction Characteristics of Soil
Using Standard Effort



Optimum Moisture Content		**12.2**	%
Maximum Dry Unit Weight		**116.5**	pcf
Cumulative material retained on:	3/4 in. sieve	0.0	%
	3/8 in. sieve	0.0	%
	#4 sieve	0.1	%

Preparation	ASTM dry preparation method	
Type of rammer	Mechanical - circular face	
Test Specfication / Method	ASTM D698-12e2-method A	
Specific gravity - D854 water pycnometer	2.60	Historical
Coarse Aggregate Specific Gravity -	2.60	

Soil Description	Nat. Moist. %	Liquid Limit	Plasticity Index	%< #200	USCS	AASHTO
Clayey SAND (SC)	13.1	25	13	28.7		

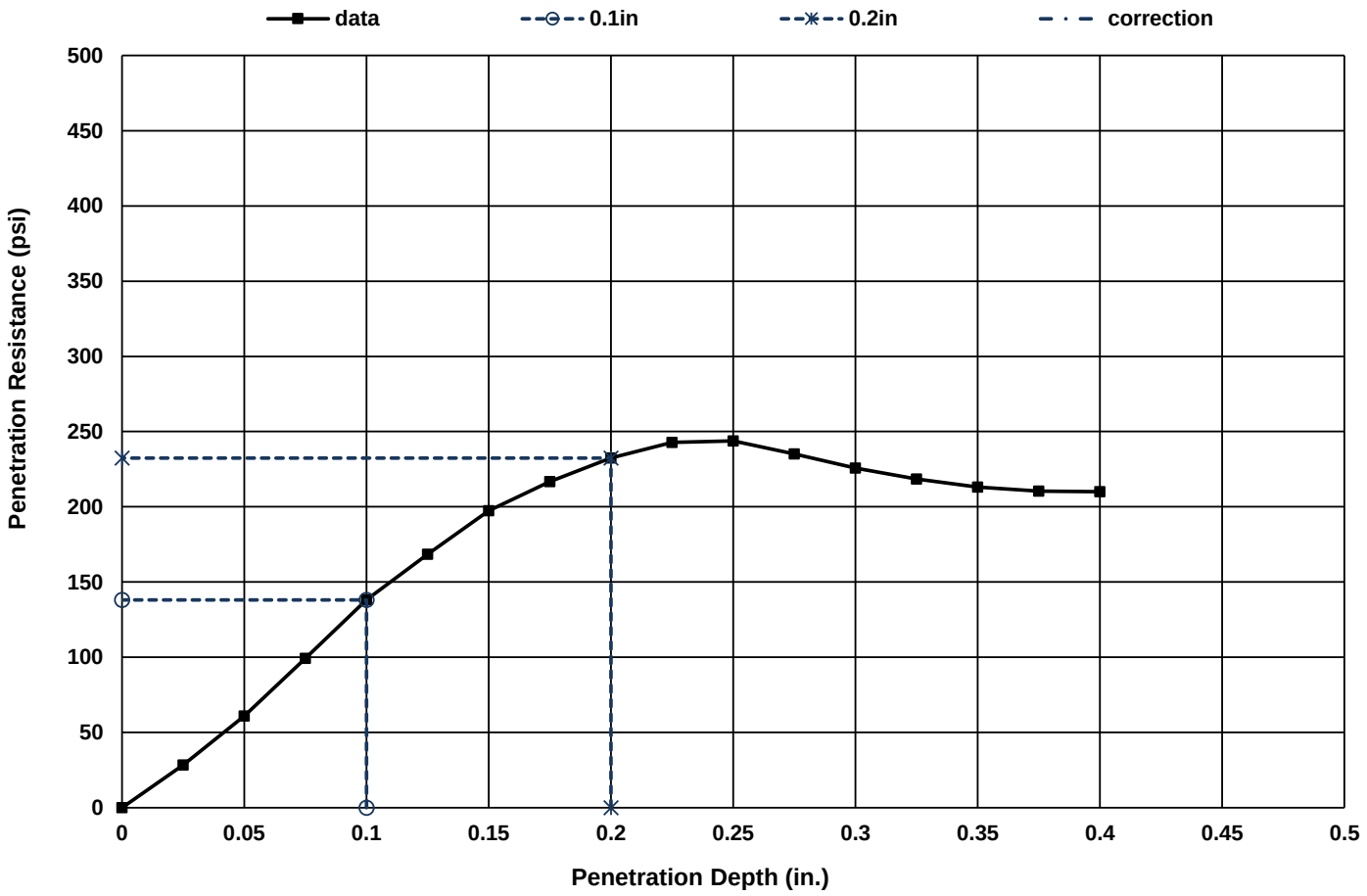
Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.
Sample / Source Composite Bulk Sample
Test Reference/No.:

Project No.: 33:5931
Depth (ft.): 1-5
Sample No.: BS-2
Date Reported:

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received	Remarks
Acreech	CMcDaniel	CMcDaniel		

California Bearing Ratios (CBR) of Laboratory-Compacted Soils



TEST RESULTS (ASTM D1883-16)

Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)		Swell (%)	
Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.1 in.	0.2 in.					
107.4	97.7	9.0	102.2	93.0	14.5	13.8	15.5	0.00	10		0.07	

Material Description	AASHTO	USCS	MAX. Dens. (pcf)	Optimum Moisture (%)	LL	PI	% Fines	% Gravel
SAND with Silt (SP-SM)			109.9	8.8	NP	NP	9.4	

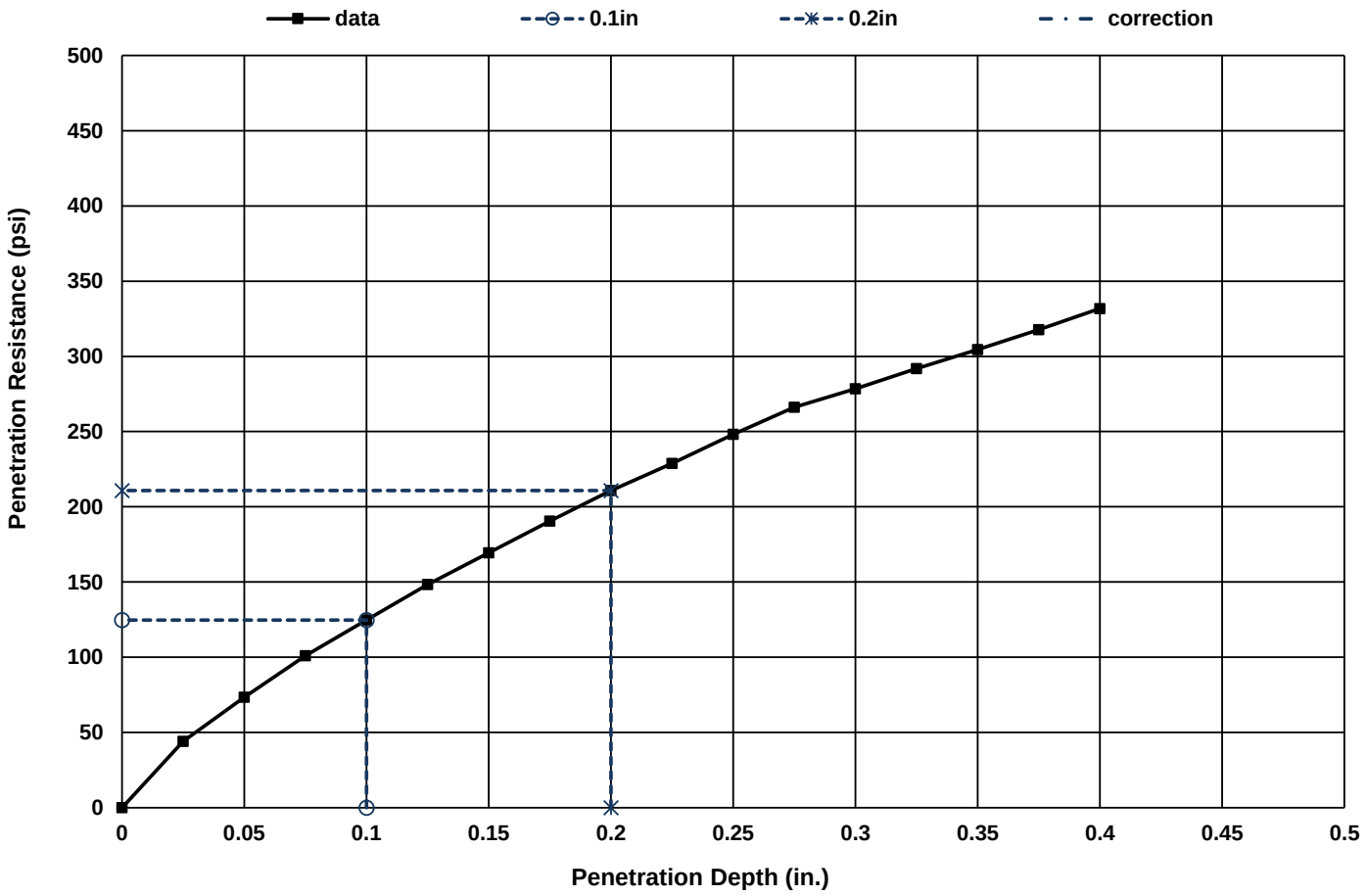
Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.
Sample / Source Composite Bulk Sample
Test Reference/No.:

Project No.: 33:5931
Depth (ft.): 1-3
Sample No.: BS-1
Date Reported: 8/2/2022

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech		

California Bearing Ratios (CBR) of Laboratory-Compacted Soils



TEST RESULTS (ASTM D1883-16)

Molded			Soaked			CBR (%)		Linearty Correction (in.)	Surcharge (lbs.)		Swell (%)	
Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.1 in.	0.2 in.					
113.9	97.8	12.7	112.2	96.3	14.4	12.5	14.1	0.00	10		0.00	
Material Description				AASHTO	USCS	MAX. Dens. (pcf)	Optimum Moisture (%)	LL	PI	% Fines	% Gravel	
Clayey SAND (SC)						116.5	12.2	25	13	28.7		

Project: Elizabethtown Runway Pavement Rehab
Client: WK Dickson & Co., Inc.
Sample / Source Composite Bulk Sample
Test Reference/No.:

Project No.: 33:5931
Depth (ft.): 1-5
Sample No.: BS-2
Date Reported: 8/2/2022

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Columbia	2031 Industrial Blvd. Lexington, SC 29072	(803)250-3377 (803)750-3174

Tested by	Checked by	Approved by	Date Received	Remarks
acreech	acreech	acreech		