CITY OF FAYETTEVILLE, NORTH CAROLINA

INVITATION TO BID – CONSTRUCTION

REHABILITATION OF TAXIWAY FOXTROT AND GOLF - Re-Advertisement
COF1517009.1

DATE ISSUED: July 10, 2026

PROPOSALS DUE: July 16, 2026

FUNDING SOURCE: Federal
AIP # 3-37-0021-061-2026

ISSUED BY: City of Fayetteville, North Carolina

PRIMARY CONTACT: Ella Gersack, Engineering Associate RS&H

Ella.Gersack@rsandh.com

(919) 926- 4136

OFFERORS ARE NOT REQUIRED TO RETURN THIS FORM.

A message from the City of Fayetteville City Manager, Dr. Douglas J. Hewett, ICMA-CM

The City of Fayetteville is fully committed to providing Small Local Business Enterprises (SLBEs) and small businesses an equal opportunity to participate in all aspects of City contracting, including but not limited to participation **in** the procurement of contracts relating to construction, professional services, equipment, supplies, and improvements to facilities throughout the City.

It is the policy of the City to prohibit discrimination against any person or business in pursuit of these opportunities on the basis of race, sex, color, religion, national origin, age, or disability, and to conduct its contracting and purchasing programs so as to prevent such discrimination. The City is committed to following all applicable federal, state, and local laws as they relate to procurement practices.

Small Business Participation Commitment

The City will actively seek and identify qualified small businesses, including SLBEs, and offer them the opportunity to participate in the procurement of contracts for all City purchasing and service contracts as well as construction and repair contracts. The City aspires to spend 40% of its eligible contract dollars with small local suppliers and contractors.

Small Business Enterprise Program

The City's Charter has been amended by the General Assembly (H.B. 198) to establish a small business enterprise program to promote the development of small local businesses. The City is authorized to establish bid and proposal specifications that include measures to enhance participation by small business enterprises located in Cumberland and Hoke Counties, including:

- Arranging solicitations, specifications, and contract requirements to facilitate small business participation
- Providing technical assistance and capacity building programs
- Carrying out information and communication programs on contracting procedures and opportunities
- Implementing outreach programs to identify and engage qualified small businesses
- Offering supportive services to help small businesses compete effectively
- Ensuring prompt payment to subcontractors
- Simplifying bonding and insurance requirements where appropriate

Federal and State-Funded Projects - Important Notice

In accordance with state directive following the U.S. Department of Transportation's October 3, 2025 Interim Final Rule to 49 CFR Part 26:

FAYETTEVILLE NC

AMERICA'S CAN DO CITY

For Federally-Funded Contracts:

- No DBE goals may be established for federally-funded contracts until further guidance is provided by the state
- All existing DBE certifications are in suspended status pending Unified Certification Program (UCP) reevaluation under new individualized disadvantage standards
- Firms are not required to submit DBE participation commitments at this time

For State-Funded Contracts:

- No MB/WBE goals may be established for state-funded contracts until further guidance is provided by the state

The City will continue to facilitate participation by all qualified small businesses through the measures listed above and will resume DBE and MB/WBE program activities once the state provides further guidance.

Equal Opportunity for All

The City is committed to:

- Providing equal access to contracting opportunities for all qualified businesses
- Removing barriers to small business participation
- Supporting economic development and capacity building in our community
- Ensuring fair and open competition in all procurements
- Maintaining compliance with all applicable federal, state, and local requirements
- Supporting diversity in our supplier and contractor base

For more information or questions about the SLBE policy, please contact the Purchasing Division at 910-433-1942.

CITY OF FAYETTEVILLE

Dr. Douglas J. Hewett, ICMA-CM
City Manager

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SECTION A – PROJECT SPECIFICS

NOTICE TO BIDDERS

Pursuant to N.C.G.S. 143-129, sealed bids will be received by the City of Fayetteville until **10:00 a.m., Thursday, July 16, at 400 Airport Road Fayetteville, NC 28306 Boeing Conference Room (1st Floor-Airport)** at which time they will be publicly opened and read aloud for the following:

REHABILITATION OF TAXIWAY FOXTROT AND GOLF

Project No. COF1517009.1

Bids may be mailed to the City Purchasing Office, Attn: Kimberly Toon, Purchasing Manager, 433 Hay Street, Fayetteville, NC 28301, or may be delivered in person or by express mail to the same address. The City of Fayetteville will not be responsible for picking up bids at the post office. Bids arriving after the hour designated for opening shall not be considered.

Plans, specifications, and bid documents may be obtained in the Purchasing Office of the City of Fayetteville, 2nd floor, City Hall, 433 Hay Street, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, or by email request to Kimberlytoon@fayettevillenc.gov. Bid Documents are also posted at: https://www.fayettevillenc.gov/City-Departments/Finance/Purchasing/Bid-Opportunities. Bidders are responsible for monitoring this site for addenda and other pertinent documents.

The advertisement for this Invitation to Bid was published at least seven (7) full days before the bid opening date in a newspaper of general circulation and/or electronically in accordance with G.S. 143-129(b).

This project **IS** funded in whole or in part with Federal Aviation Administration (FAA) Airport Improvement Program (AIP) funds. FAA federal contract provisions are incorporated herein and shall apply to all contracts and subcontracts on this project.

Questions regarding this Invitation to Bid will not be accepted. This solicitation is being re-advertised, and the question period has closed.

The City reserves the right to reject any or all bids and to waive all informalities or irregularities, taking into consideration quality, performance, and the time specified in the bids for the performance of the contract, and to award the contract to the lowest responsive and responsible bidder whose bid conforms to all material requirements of the Invitation to Bid.

TITLE VI SOLICITATION NOTICE

The City of Fayetteville, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4), 28 CFR § 50.3, and 49 CFR Part 21, hereby notifies all

bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, all contractors will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of the owner's race, color, national origin, sex, creed, age, or disability in consideration for an award.

City of Fayetteville

Kimberly Toon, CLGPO — Purchasing Manager

SPECIAL PROVISIONS

Performance and Delivery — REHABILITATION OF TAXIWAY FOXTROT AND GOLF

Project No. **COF1517009**.1

ITEM	DETAILS
Bid Receipt Date:	July 16, 2026 at 10:00 a.m. EST Attn: Ella Gersack, Engineering Associate RS&H, 400 Airport Road-Suite 1 | Fayetteville, NC 28306. Boeing Conference Room (1st Floor-Airport) Park in Short or Long Term and bring ticket in to be validated.
Mandatory Pre-Bid Conference:	The mandatory pre-bid conference for this solicitation was held on June 16, 2026, at 10:00 a.m. Attendance at the mandatory pre-bid conference was a requirement for bidder eligibility. This solicitation is being re-advertised; however, only firms that attended the mandatory pre-bid conference on June 16, 2026, at 10:00 a.m. are eligible to submit a bid. Firms that did not attend the mandatory pre-bid conference are not eligible to participate in this solicitation, and any bids submitted by non-attendees will be deemed non-responsive and will not be considered.
Estimated Contract Duration:	110 Calendar Days
Estimated Construction Start:	September 2026
Estimated Construction Completion:	January 2027
Contract Time:	110 Calendar Days
Liquidated Damages:	Time is of the essence. $1,000.00 per calendar day for each day of overrun. $1,000.00 per calendar day for each day of unauthorized suspension.
Bid Acceptance Period:	Forty-five (45) Calendar Days unless otherwise noted

Project Description

The Project scope includes the asphalt mill and airfield asphalt overlay of Taxiways F and G. Also included are taxiway shoulder modifications on Taxiway F, airfield lighting and signage replacement, and airfield markings.

Work Hour Restrictions

Limit work to between 7:00 a.m. and 6:00 p.m., Monday through Friday, unless otherwise approved in writing by the Owner and authorities having jurisdiction. Work hours may be modified to meet project requirements with prior written approval.

BID FORM SUBMITTAL CHECKLIST

The following items are required to be submitted with the bid unless otherwise noted. Failure to submit required items shall render the bid non-responsive.

Initial	Document / Form	Required?	When to Submit
	Completed Bid Proposal Package	Yes	With the bid
	Bid Bond – 5% of bid amount	Yes	With the bid
	Acknowledgement of All Addenda Issued	Yes	With the bid
	Attachment - A: Signed Non-Collusion Affidavit	Yes	With the bid
	Attachment - B: Certification of Financial Condition	Yes	With the bid
	Attachment - C: Qualifications of Bidders - 3 references	Yes	With the bid
	List of Subcontractors	Yes	With the bid
	Debarment, Suspension & Responsibility Certification	Yes	With the bid
	SDBE Program Forms / HUB Affidavits (A, B, and C).	Yes	With the bid
	Attachment - D: FAA Buy American Preference	AIP Projects	With the bid
	Attachment - E:Trade Restriction Certification	Yes	With the bid
	Attachment - F: Tax Delinquency and Felony Convictions Certification	Yes	With the bid
	Attachment - G: Certification Regarding Domestic Preferences for Procurements	Yes	With the bid
	Attachment - H: Certification Regarding Lobbying	Yes	With the bid
	Signed City of Fayetteville General Contracting Terms	Yes	With Signed Contract
	Certificate of Insurance	Yes	With Signed Contract
	Performance Bond and Payment Bond (100% each)	Yes	With Signed Contract

If any required item is not submitted with the bid, the bid shall be deemed non-responsive and will not be considered.

BID PROPOSAL PACKAGE

The undersigned hereby proposes to furnish materials and perform the work for this project per the items listed herein in strict accordance with the Standard Specifications, contained in the documents, for the consideration of prices quoted for the enclosed contract items.

THE CITY RESERVES THE RIGHT TO ELIMINATE OR ADD TO THIS CONTRACT.

IMPORTANT TAX NOTICE: Bid prices shall EXCLUDE North Carolina sales and use tax on materials that become a permanent part of this project (asphalt, concrete, aggregate, fencing, etc.), as these materials are tax-exempt pursuant to N.C. Gen. Stat. § 105-164.14(b). Equipment rental, consumables, and temporary materials remain taxable and should be included in bid pricing.

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
C-100-1	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	2	LS	$_____	$_____
C-105-1	MOBILIZATION	2	LS	$_____	$_____
GP-102-1	SAFETY AND SECURITY	2	LS	$_____	$_____
GP-103-1	TEMPORARY CONSTRUCTION ITEMS	2	LS	$_____	$_____
P-101-1	ASPHALT SHOULDER FULL DEPTH PAVEMENT REMOVAL (1.5-INCH DEPTH)	1,100	SY	$_____	$_____
P-101-2	VEHICLE SERVICE ROAD FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	430	SY	$_____	$_____
P-101-3	ASPHALT TAXIWAY FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	625	SY	$_____	$_____
P-101-4	COLD MILLING	24,770	SY	$_____	$_____
P-101-5	MILLINGS PLACEMENT FOR RADAR ROAD (COMPACTED IN PLACE)	14,040	SY	$_____	$_____
P-101-6	CONCRETE FLUME REMOVAL	140	SY	$_____	$_____
C-102-1	TEMPORARY SEEDING AND MULCHING	2,915	SY	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
C-102-2	INSTALLATION AND REMOVAL OF COMPOST SOCK	700	LF	$_____	$_____
C-102-3	INSTALLATION AND REMOVAL OF ROCK PIPE INLET PROTECTION	1	EA	$_____	$_____
C-102-4	INSTALLATION AND REMOVAL OF DROP INLET PROTECTION	2	EA	$_____	$_____
D-701-1	18-INCH CORRUGATED METAL PIPE	35	LF	$_____	$_____
P-152-1	UNCLASSIFIED EXCAVATION	125	CY	$_____	$_____
P-152-2	UNSUITABLE EXCAVATION	25	CY	$_____	$_____
P-152-3	SUBGRADE PREPARATION	890	SY	$_____	$_____
P-209-1	CRUSHED AGGREGATE BASE COURSE (5-INCH DEPTH)	890	SY	$_____	$_____
P-401-1	ASPHALT SURFACE COURSE (GRADATION 2)	8,470	TN	$_____	$_____
P-401-2	ASPHALT LEVELING COURSE (GRADATION 3)	25	TN	$_____	$_____
P-602-1	EMULSIFIED ASPHALT PRIME COAT	12,840	GA	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
P-603-1	EMULSIFIED ASPHALT TACK COAT	2,140	GA	$_____	$_____
P-620-1	SURFACE PREPARATION	3694	SF	$_____	$_____
P-620-2	WHITE REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	300	SF	$_____	$_____
P-620-3	WHITE REFLECTIVE MARKING (TYPE III WATERBORNE PAINT)	3,820	SF	$_____	$_____
P-620-4	YELLOW REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	3,230	SF	$_____	$_____
P-620-5	RED REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	1,140	SF	$_____	$_____
P-620-6	BLACK NON-REFLECTIVE MARKING (TYPE I WATERBORNE PAINT, NO GLASS BEADS)	14,120	SF	$_____	$_____
P-620-7	TYPE I GLASS BEADS, GRADATION A, REFLECTIVE MEDIA	70	LB	$_____	$_____
P-620-8	TYPE III GLASS BEADS, REFLECTIVE MEDIA	620	LB	$_____	$_____
T-901-1	SEEDING	0.4	AC	$_____	$_____
T-905-1	TOPSOIL OBTAINED ON SITE	139	CY	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
T-904-1	SODDING	795	SY	$_____	$_____
T-908-1	MULCHING	1,709	SY	$_____	$_____
L-105-1	REMOVE EXISTING STAKE MOUNTED LIGHT FIXTURE	69	EA	$_____	$_____
L-105-2	REMOVE EXISTING BASE MOUNTED LIGHT FIXTURE AND BASE CAN	12	EA	$_____	$_____
L-105-3	REMOVE EXISTING IN-PAVEMENT LIGHT FIXTURE AND BASE CAN IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-105-4	REMOVE EXISTING SIGN AND FOUNDATION	8	EA	$_____	$_____
L-105-5	MISCELLANEOUS ELECTRICAL DEMOLITION	2	LS	$_____	$_____
L-108-1	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS (INITIAL AND SUPPLEMENTAL) AND GROUND CONNECTORS	10,255	LF	$_____	$_____
L-108-2	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE	14,600	LF	$_____	$_____
L-110-1	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED IN TURF	9,400	LF	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
L-110-2	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED UNDER MILL/OVERLAY PAVEMENT	30	LF	$_____	$_____
L-110-3	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – CONCRETE ENCASED UNDER MILL/OVERLAY PAVEMENT	175	LF	$_____	$_____
L-110-4	2 WAY 2-INCH SCHEDULE 40 PVC CONDUIT - DIRECT EARTH BURIED	650	LF	$_____	$_____
L-110-5	2 WAY 2-INCH SCHEDULE 80 HDPE DIRECTIONAL DRILL	400	LF	$_____	$_____
L-115-1	JUNCTION CAN PLAZA - 2 L-867D BASE CANS	6	EA	$_____	$_____
L-125-1	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN TURF	89	EA	$_____	$_____
L-125-2	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-125-3	REINSTALL EXISTING IN-PAVEMENT LIGHT FIXTURE ON NEW BASE CAN IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-125-4	L-858(L) LED SIGN, 1-MODULE ON A NEW CONCRETE SIGN BASE	3	EA	$_____	$_____
L-125-5	L-858(L) LED SIGN, 2-MODULE ON A NEW CONCRETE SIGN BASE	2	EA	$_____	$_____
L-125-6	L-858(L) LED SIGN, 3-MODULE ON A NEW CONCRETE SIGN BASE	3	EA	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
L-125-7	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE	2	LS	$_____	$_____

This Bid Package is executed by:

ITEM	DETAILS
Name / Title:	
Company Name:	
Mailing Address:	
Email:	
Signature:	
Phone Number:	
NC Contractor License No.:	
License Classification / Limitation:	
Total Bid Amount (figures):	$
Total Bid Amount (written):	

ACKNOWLEDGEMENT OF ADDENDA

The bidder has received, acknowledged, and incorporated the following addenda in completing this Bid. (Initial and date as appropriate.)

ITEM	DETAILS
Addendum No. 1:	Dated: _____
Addendum No. 2:	Dated: _____
Addendum No. 3:	Dated: _____
Addendum No. 4:	Dated: _____

BID BOND

BID BOND — ATTACH

A Bid Bond in the amount of 5% of the total bid amount must be submitted with the bid. The Bid Bond shall be executed by a surety company licensed to do business in the State of North Carolina.

BID BOND (PENAL SUM FORM)

Bidder Name: **[Full formal name of Bidder]** Address *(principal place of business)*: **[Address of Bidder's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **[Full formal name of Owner]** Address *(principal place of business)*: **[Address of Owner's principal place of business]**	**Bid** Project *(name and location)*: **[Owner project/contract name, and location of the project]** Bid Due Date: **[Enter date bid is due]**
Bond Penal Sum: Date of **[Amount]** Bond: **[Date]**	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

ADDENDA

ADDENDA — ATTACH WHEN ISSUED

All addenda issued prior to the bid opening date shall be attached here and acknowledged on the Bid Proposal Package. It is the bidder's responsibility to check the City's procurement website for all addenda.

ATTACHMENT - A: NON-COLLUSION AFFIDAVIT

NON-COLLUSION AFFIDAVIT

STATE OF NORTH CAROLINA

_____, being first duly sworn, deposes and says that:

- He/She is the _____ of _____, the bidder that has submitted the attached bid;
- He/She is fully informed respecting the preparation and contents of the attached bid and of all pertinent circumstances respecting such bid;
- Such bid is genuine and is not a collusive or sham bid;
- Neither the said bidder nor any of its officers, partners, owners, agents, representatives, or employees has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other bidder, firm, or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted; or has in any manner, directly or indirectly, sought by agreement or collusion or communication to fix the bid price of any bidder, or to secure through collusion, conspiracy, connivance, or unlawful agreement any advantage against the City of Fayetteville or any person interested in the proposed contract; and
- The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, or parties in interest.

ITEM	DETAILS
Signature:	
Title:	
Subscribed and sworn before me this ___ day of _____, 20___.	
Notary Public:	My Commission Expires: _____

ATTACHMENT - B: CERTIFICATION OF FINANCIAL CONDITION

Name of Contractor: _____

The undersigned hereby certifies that: [check all applicable boxes]

- ☐ The Contractor is in sound financial condition and, if applicable, has received an unqualified audit opinion for the latest audit of its financial statements. Date of latest audit: _____
- ☐ The Contractor has no outstanding liabilities, including tax and judgment liens, to the Internal Revenue Service or any other government entity.
- ☐ The Contractor is current in all amounts due for federal and state taxes and required employment-related contributions and withholdings.
- ☐ The Contractor is not the subject of any current litigation or findings of noncompliance under federal or state law.
- ☐ The Contractor has not been the subject of any past or current litigation or findings of noncompliance under federal or state law that may impact its ability to fulfill the requirements of this Contract.
- ☐ He or she is authorized to make the foregoing statements on behalf of the Contractor.

NOTE: This shall constitute a continuing certification and the Contractor shall notify the Owner within fifteen (15) days of any material change to any of the representations made herein.

If any one or more of the foregoing boxes is NOT checked, Contractor shall explain the reason below:

_____

_____

ITEM	DETAILS
Signature:	
Printed Name:	
Title:	
Date:	

ATTACHMENT - C: QUALIFICATIONS OF BIDDERS In order to assist the Owner in determining whether the Bidder is qualified to perform the Work as set forth in the Contract Documents, the Bidder shall furnish the following information as an attachment to the Bid Proposal Package.

Years in business providing similar services under the same business name and legal entity:

_____

List THREE (3) Project References from clients for whom the Bidder has completed projects of similar scope and nature within the last five (5) years.

PROJECT REFERENCE 1

ITEM	DETAILS
Project Name:	
Owner Name and Contact Information:	
Project Description:	
Bidder's Role in Project:	
Contract Start Date (approx.):	
Substantial Completion Date (approx.):	
Dollar Value of Construction (approx.):	$

PROJECT REFERENCE 2

ITEM	DETAILS
Project Name:	
Owner Name and Contact Information:	
Project Description:	
Bidder's Role in Project:	
Contract Start Date (approx.):	
Substantial Completion Date (approx.):	
Dollar Value of Construction (approx.):	$

PROJECT REFERENCE 3

ITEM	DETAILS
Project Name:	
Owner Name and Contact Information:	
Project Description:	
Bidder's Role in Project:	
Contract Start Date (approx.):	
Substantial Completion Date (approx.):	
Dollar Value of Construction (approx.):	$

Bidder shall attach additional pages if necessary to complete the required information.

LIST OF SUBCONTRACTORS

The Prime Contractor states that its bid is based on the following subcontractors for the categories of work listed which may exceed 5% of the contract work. The Prime Contractor agrees that if it is the successful bidder and if the listed subcontractors are approved by the Owner's Representative, it shall contract with the approved listed subcontractors for the performance of this work. The Prime Contractor shall notify the City immediately when there are any changes to this list.

REHABILITATION OF TAXIWAY FOXTROT AND GOLF

Project No. **COF1517009**

Trade / Category	Company Name	License Number
Plumbing Contractor		
HVAC Contractor		
Electrical Contractor		
Other (specify):		
Other (specify):		
Other (specify):		

THIS FORM SHALL BE SUBMITTED WITH THE BID.

ITEM	DETAILS
Company Name:	
Bidder Signature:	
Title:	
Date:	

DEBARMENT STATEMENT

CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The Primary Participant (prime contractor) certifies to the best of its knowledge and belief that it and its principals:

- Are NOT presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- Have NOT within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- Are NOT presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated above; and
- Have NOT within a three-year period preceding this proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

If the Primary Participant is unable to certify to any of the statements above, the participant shall attach a written explanation to this certification.

THE PRIMARY PARTICIPANT CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. §§ 3801 ET SEQ. ARE APPLICABLE THERETO.

ITEM	DETAILS
Signature:	
Title:	
Printed Name:	
Date:	
Company Name:	

SDBE PROGRAM & AFFIDAVITS

A. City of Fayetteville SDBE Program

The City of Fayetteville is committed to broadening economic opportunity by encouraging the participation of Small Disadvantaged Business Enterprises (SDBEs) in City-funded contracts. The SDBE Program applies to this solicitation. An SDBE is a business concern that is (1) small as defined by applicable SBA size standards or City thresholds for the relevant NAICS code, and (2) owned and controlled by individuals who have experienced economic disadvantage — without regard to race, gender, or ethnicity.

SDBE Participation Goal for this Solicitation: 0% of the total contract value. (Set by the Procurement Officer based on project type and available SDBE capacity.)

Good Faith Efforts: Bidders are expected to make good-faith efforts to identify and engage SDBE-certified firms as subcontractors, subconsultants, or suppliers. Document efforts including: solicitation of SDBE firms, responses received, and the basis for any selection or rejection of SDBE quotes. To search for certified SDBE firms, contact the City of Fayetteville Purchasing Division or visit www.fayettevillenc.gov/purchasing.

PART I — SDBE Certification Status

Is your firm a City of Fayetteville certified SDBE? ☐ Yes ☐ No

If YES, provide SDBE Certificate No.: _____

If NO, are you interested in SDBE certification? ☐ Yes ☐ No

PART II — SDBE Subcontractor / Supplier Utilization

Will you use SDBE-certified firms for any portion of this contract? ☐ Yes ☐ No

B. NC HUB Program (G.S. 143B-1361; G.S. 143-128.2)

Pursuant to N.C.G.S. 143B-1361(a) and 143-128.2, the City encourages participation by NC-certified Historically Underutilized Businesses (HUBs). The City will comply with applicable HUB utilization requirements based on funding source. HUB firms that are also SDBE-certified may be counted toward both programs.

Is your firm a NC-certified HUB entity? ☐ Yes ☐ No

If YES, provide HUB Vendor #: _____

HUB Participation Goal for this Solicitation: 0% of the total contract value.

HUB AFFIDAVIT - A: Good Faith Efforts Documentation

This solicitation does not require submission of HUB Affidavit A (Good Faith Efforts Documentation)

HUB GOOD FAITH EFFORTS — How General Contractor Plans to Meet HUB Goals

HUB AFFIDAVIT - B: 100% Self-Performance in Lieu of HUB Participation Goal

This solicitation does not require submission of HUB Affidavit B (100% Self-Performance)

HUB AFFIDAVIT - C: Meeting the HUB Participation Percentage Goal

This solicitation does not require submission of HUB Affidavit C (Meeting HUB Participation Goal)

C. Federal Disadvantaged Business Enterprise (DBE) Program

Authority: 49 CFR Part 26; 49 U.S.C. § 47113

This project is subject to the City of Fayetteville's FAA-approved Disadvantaged Business Enterprise (DBE) Program on file with the FAA Office of Civil Rights. The DBE contract goal for this project is **0%**, established as required by the USDOT DBE Interim Final Rule effective October 3, 2025 (49 CFR § 26.111) and per NCDOT Division of Aviation guidance issued October 6, 2025. Until the North Carolina Unified Certification Program (NCUCP) completes its reevaluation of all certified DBE firms, no DBE contract goals may be set on federally funded projects.

The mandatory 49 CFR § 26.13 contract assurance (Construction Contract Article 7.8.1) must be incorporated verbatim in all subcontracts and sub-tier agreements on this project.

For DBE firm certification information contact the NC Unified Certification Program (NCUCP): ncdot.gov/business/small business

SMALL BUSINESS AND DISADVANTAGED BUSINESS ENTERPRISE PROGRAMS

1.1 Applicability of DBE Requirements

If this Contract involves federal funding from the U.S. Department of Transportation (USDOT) or other federal agencies requiring Disadvantaged Business Enterprise (DBE) participation, Contractor agrees to

comply with all applicable federal DBE requirements as set forth in 49 C.F.R. Part 26, as amended, and the City's approved DBE program.

1.2 DBE Program Compliance Under October 3, 2025 Interim Final Rule

Contractor acknowledges that effective October 3, 2025, USDOT removed race- and sex-based presumptions of social and economic disadvantage from the DBE program. All DBE participation must now be based on individualized determinations of social and economic disadvantage without regard to race or sex.

1.2.1 Current Certification Requirements

Any DBE firm utilized by Contractor to meet DBE goals must be properly certified under the revised standards requiring:

(a) Individualized demonstration of social and economic disadvantage based on the owner's personal experiences and circumstances within American society, without regard to race or sex;

(b) A personal narrative establishing the existence of disadvantage based on specific instances of economic hardship, systemic barriers, and denied opportunities that blocked the owner's progress or success in education, employment, or business, including getting financing on terms available to another person who had advantages and was similarly situated;

(c) Current certification through the North Carolina Unified Certification Program (NCUCP) or other applicable state or regional Unified Certification Program (UCP);

(d) Compliance with personal net worth and business size standards as established in 49 C.F.R. Part 26.

1.2.2 Recertification Process

Contractor acknowledges that all previously certified DBE firms are subject to mandatory reevaluation and recertification under the new individualized standards. Until a DBE firm completes recertification under the October 3, 2025 rule:

(a) The firm's participation may not be counted toward DBE goals on new contracts;

(b) Contractor bears the risk of utilizing firms whose certifications may be decertified during the reevaluation process;

(c) Contractor must verify current certification status with the NCUCP before executing subcontracts with DBE firms.

1.2.3 DBE-Neutral and DBE-Conscious Measures

Consistent with the revised federal regulations, the terms "race-neutral" and "race-conscious" are replaced with "DBE-neutral" and "DBE-conscious" measures. The City's DBE program will utilize

DBE-neutral measures to the maximum extent feasible before implementing any DBE-conscious contract goals.

1.3 Contract-Specific DBE Goals

If a specific DBE participation goal has been established for this Contract, that goal is: 0 %.

Contractor must meet this goal through one or more of the following methods:

(a) By subcontracting a portion of the work to qualified, certified DBE firms;

(b) By demonstrating good faith efforts to meet the goal as defined in 49 C.F.R. § 26.53;

(c) By obtaining a waiver from the City based on documented unavailability of qualified DBE firms.

1.4 Good Faith Efforts

If Contractor is unable to meet the stated DBE goal, Contractor must demonstrate that it made adequate good faith efforts to meet the goal. Good faith efforts include, but are not limited to:

(a) Soliciting through all reasonable and available means the interest of certified DBEs;

(b) Attending pre-bid meetings to inform DBEs of contracting and subcontracting opportunities;

(c) Providing interested DBEs with adequate information about plans, specifications, and requirements;

(d) Negotiating in good faith with interested DBEs and not rejecting DBEs as unqualified without sound reasons;

(e) Making portions of the work available to DBE firms, including breaking down contracts into economically feasible units;

(f) Providing assistance in obtaining bonding, lines of credit, or insurance required by the City or Contractor;

(g) Effectively using services of available business assistance organizations.

1.5 North Carolina Small Business Enterprise (SBE) Program

If this Contract is subject to North Carolina state requirements (NCGS § 143-128.2 and 01 NCAC 30I), Contractor agrees to comply with applicable Small Business Enterprise program requirements.

1.5.1 NCDOT SBE Program (If Applicable)

For projects administered by or in coordination with the North Carolina Department of Transportation, Contractor acknowledges that businesses with annual gross income exceeding $1,500,000 (exclusive of materials) are not eligible to participate as SBEs under the NCDOT SBE Program.

1.5.2 Statewide NCSBE Program (If Applicable)

For projects subject to the North Carolina Department of Administration's Statewide Small Business Enterprise (NCSBE) Program, eligible businesses must:

(a) Be headquartered in North Carolina;

(b) Have annual net income not exceeding $1,500,000 after cost of goods sold is deducted;

(c) Have up to 100 employees;

(d) Maintain current NCSBE certification through the NC Office for Historically Underutilized Businesses (HUB).

1.6 Counting DBE/SBE Participation

DBE and SBE participation will be counted in accordance with the provisions of 49 C.F.R. § 26.55 and applicable state regulations. Only the work actually performed by certified DBE/SBE firms using their own employees, or work that the firm is directly responsible for, will count toward meeting goals.

1.7 Reporting and Record-Keeping Requirements

Contractor shall:

(a) Submit DBE/SBE utilization reports with each monthly payment application, documenting actual payments made to DBE/SBE subcontractors;

(b) Maintain records demonstrating payments to DBE/SBE firms for three (3) years following final project completion;

(c) Provide copies of executed subcontracts and evidence of payment upon City request;

(d) Immediately notify the City if a DBE/SBE firm is terminated or fails to perform, and document good faith efforts to replace the firm with another qualified DBE/SBE.

1.8 Prohibition Against Discrimination

Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 and NCGS § 143-128.2 in the award and administration of this Contract.

1.8.1 Mandatory DBE Assurance — MANDATORY TEXT (49 CFR § 26.13) — Must Be Included Verbatim in All Subcontracts

The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to: (1) Withholding of payments to the contractor under the contract until the contractor complies; and/or (2) Cancelling, terminating, or suspending a contract, in whole or in part. This assurance must be included verbatim in all subcontracts and sub-tier agreements on this project.

1.9 Prompt Payment to Subcontractors

Contractor agrees to pay all subcontractors, including DBE and SBE subcontractors, for satisfactory performance of their contracts no later than thirty (30) days from Contractor's receipt of payment from the City. Any delay or postponement of payment must be for good cause and with the City's prior written approval.

Contractor further agrees to return any retainage payments to subcontractors within thirty (30) days after the subcontractor's work is satisfactorily completed and accepted by the City.

1.10 Commercially Useful Function

A DBE or SBE performs a commercially useful function when it is responsible for execution of the work and actually performs, manages, and supervises the work involved. To count toward DBE/SBE goals, the firm must carry out its responsibilities by actually performing, managing, and supervising the work with its own workforce.

1.11 Substitution of DBE/SBE Firms

Contractor shall not terminate or substitute a DBE or SBE firm listed in the original proposal without the City's prior written consent. Requests for substitution must include:

(a) Documentation of good cause for the requested substitution;

(b) Written notice provided to the DBE/SBE firm with an opportunity to respond;

(c) Documentation of good faith efforts to find an acceptable replacement DBE/SBE firm, if applicable.

1.12 Sanctions for Non-Compliance

Failure to comply with DBE/SBE requirements may result in:

(a) Withholding of progress payments;

(b) Suspension or termination of the Contract;

(c) Debarment from future City contracts;

(d) Such other remedies as may be available under federal or state law.

1.13 Federal Funding Acknowledgment

If this Contract is funded in whole or in part with federal funds, Contractor acknowledges that federal requirements take precedence over state and local requirements to the extent of any conflict, and that the City's DBE program operates in compliance with USDOT requirements.

ATTACHMENT - D: FAA BUY AMERICAN PREFERENCE CERTIFICATION

Equipment/Building Projects Authority: 49 U.S.C. § 50101; Infrastructure Investment and Jobs Act (P.L. 117-58); FAA Reauthorization Act of 2024, P.L. 118-63 § 768
As a matter of bid responsiveness, the bidder must complete, sign, date, and submit this certification with the bid.

[ ] Bidder hereby certifies that it WILL comply with 49 U.S.C. § 50101, the Build America, Buy America Act, and related FAA policies by: (a) only installing steel and manufactured products produced in the United States; (b) only installing construction materials manufactured in the United States; (c) installing manufactured products for which the FAA has issued a waiver; or (d) installing products listed as Excepted Articles under FAR Subpart 25.108.

[ ] Bidder hereby certifies that it CANNOT comply with the 100% Buy American preference of 49 U.S.C. § 50101(a) but may qualify for a Type 3 waiver under 49 U.S.C. § 50101(b). Bidder agrees to submit complete waiver documentation to the Owner and FAA within 15 calendar days of selection as the apparent low bidder.

Note (P.L. 118-63 § 768): Federal funds may not be used to procure buses or rail car vehicle rolling stock from covered entities.

False Statements: Per 49 U.S.C. § 47126, a false, fictitious, or fraudulent certification may render the maker subject to prosecution under 18 U.S.C. § 1001.

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

ATTACHMENT - E: TRADE RESTRICTION CERRTIFICATION

Authority: 49 U.S.C. § 50104; 49 CFR Part 30

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

- is **not** owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
- 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 USTR list; and
- has **not** entered into any subcontract for any product to be used on this Federal project that is produced in a foreign country on such USTR list.

This certification concerns a matter within the jurisdiction of an agency of the United States of America. A false, fictitious, or fraudulent certification may render the maker subject to prosecution under 18 U.S.C. § 1001. The Offeror agrees to incorporate this certification without modification in all lower-tier subcontracts (49 CFR § 30.17).

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

ATTACHMENT - F: TAX DELINQUENCY AND FELONY CONVICTIONS CERTIFICATION

Authority: Consolidated Appropriations Act, 2022, P.L. 117-103 § 8113; DOT Order 4200.6

The applicant must complete both statements by inserting a checkmark in the applicable response:

1. The applicant represents that it [ ] IS [ ] IS NOT a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
2. The applicant represents that it [ ] IS [ ] IS NOT a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note: An affirmative response to either statement renders the applicant ineligible to receive an award unless the agency Suspension and Debarment Official (SDO) has determined that further action is not required to protect the Government's interests. The applicant agrees to incorporate this certification in all lower-tier subcontracts.

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

ATTACHMENT – G: CERTIFICAITON REGARDING DOMESTIC PREFERANCES FOR PROCUREMENTS

Authority: 2 CFR § 200.322; 2 CFR Part 200, Appendix II(L)

The Bidder or Offeror certifies by signing and submitting this bid or proposal that, to the greatest extent practicable, the Bidder or Offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including, but not limited to, iron, aluminum, steel, cement, and other manufactured products) in compliance with 2 CFR § 200.322.

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

ATTACHMENT - H: CERTIFICATION REGARDING LOBBYING

Authority: 31 U.S.C. § 1352; 2 CFR Part 200, Appendix II(I) Required for contracts and subcontracts of $100,000 or more.

The undersigned certifies, to the best of its knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, 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, or the extension, continuation, renewal, amendment, or modification thereof.
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 language of this certification must be included in the award documents for all sub-awards at all tiers, and all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact. 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.

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

SECTION B – ADMINISTRATIVE PROVISIONS

DEFINITION OF TERMS

The contract documents consist of the Notice to Bidders, Instructions to Bidders, Contract Requirements, Requirements of the Work, Special Conditions if applicable; the Drawings and Specifications, including all bulletins, addenda, or other modifications incorporated into the documents prior to their execution; the Proposal; the Contract; the Performance Bond; the Payment Bond; Insurance Certificates; and the approval of the City Attorney. All of these items together form the contract.

Whenever in these specifications and contract the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

- **Owner / City:** The City of Fayetteville, North Carolina.
- **Engineer / Owner's Representative:** The licensed engineer or authorized representative designated by the City to administer the contract and provide general oversight of construction.
- **Contractor:** The individual, firm, partnership, or corporation to whom the contract has been awarded.
- **Subcontractor:** Any person, firm, or corporation other than employees of the Contractor who contracts with the Contractor to perform a portion of the work.
- **Contract Documents:** All documents that form the agreement between the City and the Contractor, including the Invitation to Bid, Instructions to Bidders, Bid Proposal, Special Provisions, Technical Specifications, Drawings, Addenda, the executed Contract, Performance Bond, Payment Bond, Insurance Certificates, and the Notice to Proceed.
- **Work:** All labor, materials, equipment, and services necessary to complete the project in accordance with the Contract Documents.
- **Contract Time:** The number of calendar days allowed for the completion of the work as specified in the Special Provisions.
- **Calendar Day:** Any day inclusive of a legal holiday, Saturday, or Sunday. Unless work is suspended for causes beyond the Contractor's control, regular work requiring the presence of the superintendent will be considered as a calendar day.
- **Substantial Completion:** The stage in the progress of the work when the work or designated portion thereof is sufficiently complete so that the City can occupy or utilize the work for its intended use.
- **Final Completion:** The point at which all work is fully completed in accordance with the Contract Documents and the City has issued written acceptance.
- **Notice to Proceed:** A written communication issued by the City authorizing the Contractor to commence work.

- **Change Order:** A written modification to the Contract executed by the City and the Contractor establishing an equitable adjustment in the Contract Sum, Contract Time, or both.
- **Directed / Required:** Whenever these words or words of like import are used, it shall be understood that the direction or requirement of the Engineer is intended.
- **Approved / Acceptable:** Shall mean approved by, or acceptable to the Engineer, subject in each case to the final determination of the City.

INSTRUCTIONS TO BIDDERS

1. PROPOSAL

Proposals shall be made in strict accordance with the Bid Proposal Package provided herein, and all blank spaces for bids, alternates, and unit prices shall be properly filled in. When requested alternates are not bid, the proposal may be considered incomplete. Any modifications to the Bid Proposal Package (including alternates and/or unit prices) will disqualify the bid and shall cause the bid to be rejected.

The Bidder agrees that the Bid Proposal Package detached from specifications will be considered and will have the same force and effect as if attached thereto. Numbers shall be stated both in writing and in figures for the base bids and alternates. Unit prices shall include overhead, profit, and taxes and shall be the full compensation for the Bidder's cost.

2. EXAMINATION OF CONDITIONS

By submitting a bid, the Bidder affirms that it has carefully examined all documents pertaining to the work, the location, accessibility, and general character of the site of the work and all existing structures within and adjacent to the site, and has satisfied itself as to the nature of the work, the condition of existing structures, the conformation of the ground, the character, quality, and quantity of material to be encountered, the character of equipment and facilities needed, general and local conditions, construction hazards, and all other matters including but not limited to the labor situation and all safety measures required by the Occupational Safety and Health Act of 1970.

The City will make copies of all surveys and investigative reports available to the Bidder upon request. Each Bidder may, at its own expense, make such additional investigations as it deems necessary to determine its bid price. Any on-site investigation shall be done at the convenience of the City.

3. FAMILIARITY WITH LAWS

The Bidder is assumed to have made itself familiar with all federal, state, and local laws, ordinances, and regulations which in any manner affect those engaged or employed in the work or the materials or equipment used in or upon the work, or in any way affect the conduct of the work. Ignorance of the law shall not relieve the Bidder of any obligation.

4. PREPARATION OF PROPOSAL

The Bidder must submit its bid proposal on the blank forms provided, and prices must be given both in writing and in figures. The Bidder shall sign its proposal correctly. If the proposal is made by an individual, the name and address must be shown. If made by a corporation, the person signing shall state the state of incorporation, the location of the home office, and the name and title of the officer authorized under the bylaws to sign contracts.

5. LICENSING

The successful Contractor must be properly licensed to perform the work in accordance with the North Carolina General Statutes (Chapter 87, Article 1). The Contractor must hold an Unlimited General Contractor license for contracts exceeding $500,000, or the appropriate limited license for lesser amounts. Upon request, bidders shall show evidence of proper license type and limitation.

6. BULLETINS AND ADDENDA

Any addenda to specifications issued during the time of bidding are to be considered covered in the proposal and in closing a contract they will become a part thereof. It shall be the Bidder's responsibility to ascertain prior to bid time all addenda issued and to see that its bid includes any changes thereby required.

Should the Bidder find discrepancies in, or omissions from, the drawings or documents, or should it be in doubt as to their meaning, it shall at once notify the Contracting Office, which will send written instructions in the form of addenda to all bidders. Notification should be no later than seven (7) days before the date set for receipt of bids. All addenda shall be acknowledged by the Bidder on the Proposal Form.

7. BID SECURITY

Each proposal shall be accompanied by a cash deposit, certified check, or cashier's check drawn on a bank insured by the Federal Deposit Insurance Corporation, payable to the City of Fayetteville in an amount equal to not less than 5% of the proposal, or in lieu thereof a bidder may offer a bid bond in the amount of 5% of the bid executed by a surety company licensed under the laws of the State of North Carolina. Said deposit shall be retained by the Owner as liquidated damages in the event of failure of the successful bidder to execute the contract within ten (10) days after the award or give satisfactory surety as required by law.

8. DELIVERY OF PROPOSAL

Each proposal must be submitted in a sealed opaque envelope marked to indicate its contents, project number, project title, bidder's name, address, and contractor's license number and status. Bids may be mailed to the City of Fayetteville Purchasing Department, Attn: Kimberly Toon, Purchasing Manager, 433 Hay Street, Fayetteville, NC 28301, or may be delivered in person or by express mail to the same address.

9. RECEIPT OF BIDS

Bids shall be received in strict accordance with the requirements of the General Statutes of North Carolina. Bids received after the time designated for opening shall not be considered and shall be returned to the Bidder unopened.

10. WITHDRAWAL OF PROPOSAL

If the Bidder desires to withdraw its proposal, it must do so before the time fixed for the receipt of bids, without prejudice, by communicating its purpose in writing to the City, and when received the sealed envelope shall be returned to the Bidder unread. Bids may not be withdrawn after the time for receipt for a period of forty-five (45) days, unless the price was based on a clerical or material error pursuant to N.C.G.S. 143-129.1.

11. BID OPENING

Bids will be publicly opened and read aloud at **10:00 a.m., Thursday, July 16, 2026, at 10:00 a.m. EST, 400 Airport Road-Suite 1 (Boeing Conference Room - 1st Floor-Airport) Fayetteville, NC 28306.** Bidders or their authorized agents are invited to be present. Upon opening, all bids shall become the property of the City and will not be returned.

12. BID EVALUATION

A. RESPONSIVENESS DETERMINATION

Before awarding a contract, the City will first determine whether each bid is responsive. A responsive bid is one that conforms to all material requirements of the Invitation to Bid without material deviation. A responsive bid must:

- Be submitted on the required Bid Proposal Package form;
- Include all required signatures, acknowledgments, and certifications;
- Be received at the designated location by the time and date specified;
- Include all required submittals listed in the Bid Form Submittal Checklist;
- Acknowledge all addenda issued during the bidding period;
- Provide unit prices and total bid amount for all bid items with no blank spaces, alterations, or conditional pricing; and
- Be free from material mathematical errors that affect the bid ranking.

Bids that fail to meet these responsiveness criteria may be rejected as non-responsive. The City may waive minor informalities or irregularities that do not affect the bid price or give a bidder a competitive advantage. Award shall be made to the lowest responsive, responsible bidder pursuant to G.S. 143-129.

B. RESPONSIBILITY DETERMINATION

After determining responsiveness, the City will evaluate whether the apparent low bidder is responsible by requiring the bidder to furnish within five (5) business days of request:

- Certification of Financial Condition (Appendix B);
- A listing of three (3) completed projects of similar scope and nature within the last five (5) years (Appendix C);
- Permanent name and address of place of business;
- The number of employees and length of time in business under the present name;
- Appropriate North Carolina contractor's license (Chapter 87, Article 1);
- Ability to obtain required Performance and Payment Bonds (100% of contract amount) from a surety authorized to do business in North Carolina; and
- Ability to obtain required insurance coverage as specified in Contract Requirements.

CONTRACT REQUIREMENTS

1. AWARD OF CONTRACT

All contracts shall be awarded by the City of Fayetteville within forty-five (45) calendar days from the date of the opening of the proposals. The said forty-five (45) calendar-day period may be extended by written consent of the bidders whose proposal guarantees are held by the City.

2. TIME IN WHICH TO EXECUTE CONTRACT

The bidder to whom award has been made must execute the contract and return the same with the appropriate bonds and a certificate of insurance as required herein to the City Purchasing Department within ten (10) days after the contract has been presented to the successful bidder for signature. If the bidder refuses or neglects to execute the contract, the amount of the proposal guaranty shall be forfeited to the use of the City, not as a penalty but as liquidated damages. The City may, if deemed advisable, extend this time.

3. CONTRACT BONDS REQUIRED

The successful bidder, at the time of the execution of the contract, shall provide the City with a contract payment bond and a contract performance bond in compliance with N.C.G.S. Chapter 44A, Article 3 as follows:

- A performance bond in the amount of one hundred percent (100%) of the construction contract amount, conditioned upon the faithful performance of the contract in accordance with the plans, specifications, and conditions of the contract. Such bond shall be solely for the protection of the City of Fayetteville.
- A payment bond in the amount of one hundred percent (100%) of the construction contract amount, conditioned upon the prompt payment for all labor or materials for which the Contractor or subcontractor is liable. The payment bond shall be solely for the protection of the persons furnishing materials or performing labor.

The corporate surety furnishing the bonds shall be authorized to do business in North Carolina and shall be acceptable to the City Attorney, with an A.M. Best rating of A-VII or better. All bonds shall be executed on the Performance Bond and Payment Bond forms provided in Section B.

4. INSURANCE REQUIREMENTS

The Contractor shall not commence work under this Contract until all required insurance has been obtained and approved. The Contractor shall not allow any subcontractor to commence work until all similar insurance has been obtained and approved. Required insurance:

- **Commercial General Liability (ISO #CG 00 01 10 93):** $1,000,000 per occurrence; $2,000,000 aggregate (other than products/completed operations); $2,000,000 aggregate for products/completed operations.
- **Automobile Liability (ISO #CA 00 01 12 93):** $1,000,000 combined single limit per accident for bodily injury and property damage from owned, non-owned, and hired automobiles.
- **Workers' Compensation and Employers' Liability:** Workers' Compensation as required by NC law; Employers' Liability with limits of $100,000 each accident, $500,000 policy limit, $100,000 each employee.

- **Owner's and Contractor's Protective Liability (ISO #CG 00 09 10 93):** $1,000,000 per occurrence / $2,000,000 aggregate, for the City of Fayetteville.

All insurance policies shall be written by insurers licensed to do business in North Carolina and rated A-VII or better by A.M. Best. The City of Fayetteville must be named as Additional Insured on all applicable policies. Certificates must include thirty (30) days' prior written notice of cancellation by certified mail to the City of Fayetteville Procurement Office, 433 Hay Street, Fayetteville, NC 28301. Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates for each subcontractor.

5. SUBLETTING / ASSIGNING CONTRACT

The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the contract or any portion thereof without the written consent of the City Council. Except as may be required under the Performance Bond or Payment Bond, no funds due the Contractor under the contract may be assigned.

6. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

Time is of the essence. The Contractor is required to commence work within ten (10) calendar days after written Notice to Proceed from the City. The Contractor shall complete all work within the Contract Time specified in the Special Provisions. A liquidated damage charge will be assessed for each day of overrun as specified in the Special Provisions, which the Contractor agrees by executing the contract represents a just and reasonable estimate of the City's damages. Liquidated damages for unauthorized suspension of work shall also apply as set forth in the Special Provisions.

7. CONSTRUCTION SCHEDULE

Upon receipt of Notice to Proceed, and prior to beginning work, the Contractor shall submit a construction schedule to the Project Manager showing all work activities in a logical sequence with projected completion dates for each. The schedule shall be in Critical Path Method (CPM) format. Said schedule is to be updated and submitted monthly with the Contractor's application for payment. Payments will be held until the Contractor is in compliance with this requirement.

8. INTENT OF PLANS AND SPECIFICATIONS

The drawings and specifications are complementary, one to the other. That which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a complete job.

9. CONSTRUCTION STAKING

The General Contractor is responsible for all construction staking required for this project.

10. ENGINEER STATUS

The Engineer shall provide general administration of the performance of construction contracts, including liaison and necessary inspection of the work to ensure compliance with plans and specifications. The Engineer is the agent of the City only for the purpose of constructing this work and to the extent stipulated in the contract documents. The Engineer has authority to stop work, order work removed, or order corrections of faulty work where such action is necessary to assure successful completion of the work.

11. PLANS AND WORKING DRAWINGS

The Engineer will furnish all drawings necessary to show the line, grade, and details of all construction work to be done under this contract. Any deviation from the plans and specifications, as may be required by the exigencies of construction, will in all cases be determined by the Engineer. The Engineer reserves the right to make alterations in the plans or in the character of the work from time to time as may be necessary or desirable to complete the work fully and perfectly.

12. CLARIFICATIONS AND DETAIL

In cases where the nature of the work requires clarification by the Engineer, such clarification shall be furnished with reasonable promptness by means of written instructions or detail drawings, or both. The Contractor shall not proceed with affected work without such clarifications.

13. MINOR CHANGES IN THE WORK

The Engineer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents.

14. TEMPORARY SUSPENSION OF THE WORK

The Engineer shall have the authority to suspend the work, wholly or in part, for such period as may be deemed necessary due to unsuitable weather or conditions unfavorable for prosecution of the work, or due to failure on the part of the Contractor to carry out orders or perform provisions of the contract. The Contractor shall not suspend work without authority.

15. AUTHORITY AND DUTIES OF PROJECT ENGINEER

Project engineers employed by or designated by the City are authorized to inspect all work performed and materials furnished. Such inspection may extend to all parts of the work and the preparation of materials. A project engineer may be stationed on the work to report progress and compliance. The project engineer shall have authority to reject materials or suspend work pending resolution of disputes. Any suspension ordered for rejected materials or improper technique shall not be the basis of a claim for additional contract time or price adjustment.

16. SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

The Contractor shall submit to the Engineer all shop drawings, descriptive data, samples, color charts, and other submittals required for the work. The Engineer shall review the shop drawings promptly, noting desired corrections, if any, and shall return copies to the Contractor within fourteen (14) calendar days after receipt. Approval of shop drawings shall not relieve the Contractor from responsibility for compliance with the design or terms of the contract documents unless such lack of compliance or errors have first been called in writing to the attention of the Engineer and specifically accepted in writing by the Engineer.

17. INSPECTION OF THE WORK

The work shall be subject to inspection during normal working hours by the Engineer, designated representatives of the City, and persons required by state law or local ordinance to test special work for official approval. The Contractor shall provide safe access to the work at all times. Should any work be covered prior to inspection and approval by the Engineer, such work shall be uncovered for inspection if so requested. All costs of uncovering, repairing, and restoring work that is found defective shall be paid by the Contractor.

18. TESTING

The City reserves the right to test any or all materials and workmanship by a certified independent testing laboratory at City expense. Testing shall be accomplished as deemed necessary by the Engineer. Any necessary re-testing due to failures shall be at the Contractor's expense.

19. USE OF A SECTION OF THE WORK

Whenever in the opinion of the Engineer any portion of the work is completed or is in acceptable condition for use, it shall be used for its intended purpose as directed. Such use shall not be held to constitute acceptance of that portion or a waiver of any specifications and contract requirements.

20. EXECUTION OF WORK

The Contractor shall begin work within ten (10) calendar days after the Notice to Proceed. The Contractor will be required to execute the work in a continuous and uninterrupted manner from the time it begins the work until completion and final acceptance. The Contractor is not permitted to suspend operations except for reasons beyond its control or where the Engineer has authorized a suspension in writing. If operations are suspended in violation of these provisions, liquidated damages will be charged for each and every calendar day of unauthorized suspension.

21. CITY'S RIGHT TO DO WORK

If, during the progress of the work or during the guarantee period, the Contractor fails to execute the work properly or to perform any provision of the contract, the City, after fifteen (15) days' written notice sent by certified mail to the Contractor from the Engineer, may perform or have performed that portion of the work. The cost of such work may be deducted from amounts due or to become due to the Contractor.

22. CHANGE ORDERS

The City may have changes made in the work covered by the contract. These changes will not invalidate or relieve the Contractor from its guarantee given under the contract provisions, will not affect the validity of the guarantee bonds, and will not relieve the surety of said bonds. All extra work shall be executed under the conditions of the original contract.

Except in an emergency endangering life or property, no changes shall be made by the Contractor except upon written Change Order from the City. No claim for adjustment of the contract price shall be valid unless this procedure is followed.

Changes in the work shall be priced by one of the following methods, in order of preference: (a) a mutually acceptable lump sum fixed price; or (b) application of unit prices specified in the contract documents or mutually agreed upon.

IMPORTANT — FAA PROHIBITION: Cost-plus-a-percentage-of-cost pricing is strictly prohibited on this project pursuant to 2 CFR Part 200, Appendix II(D). Under no circumstances shall change orders be priced as a percentage markup applied to total costs incurred. All change orders must be settled as a lump sum or on unit price terms.

REQUIRED FORMS (POST-AWARD)

The following forms and documents are required from the successful bidder after award and before or during contract execution. Failure to provide required post-award documents within the time specified may result in forfeiture of the bid bond and award to the next responsive bidder.

ITEM	DETAILS
Performance Bond (100%)	Within 10 days of award notification
Payment Bond (100%)	Within 10 days of award notification
Certificate(s) of Insurance	Within 10 days of award notification
Power of Attorney (Surety)	With bonds
Executed Contract	Within 10 days of award notification
NC Contractor License Copy	With executed contract
E-Verify Compliance Cert.	With executed contract
Schedule of Values	Within 15 days of Notice to Proceed
Construction Schedule (CPM)	With or before first pay application
SDBE/HUB Utilization Report	With each pay application
Weekly Certified Payrolls	Ongoing (Davis-Bacon projects)

GENERAL STATUTES GUIDELINES

All Prospective Bidders are Hereby Advised to Become Familiar with Certain Provisions of the General Statutes of North Carolina. The following list is furnished for your information and is not meant to be all-inclusive. Full compliance with the current General Statutes of North Carolina applicable to this contract shall be required from all bidders.

ITEM	DETAILS
Chapter 44A, Article 3	Payment and Performance Bonds
Chapter 87	Contractors (Licensing Requirements)
Chapter 87, Article 1	General Contractors
Chapter 105-164.14	Sales Tax Exemption for Construction Materials
Chapter 113A, Article 4	Sedimentation Pollution Control Act
Chapter 143, Article 8	Public Contracts
Chapter 143, Article 21	Water and Air Resources
Chapter 143, Article 21B	Air Pollution Control
~~**Chapter 143-129**~~	~~Formal Bidding — Construction~~
Chapter 143-129.1	Bid Withdrawal for Clerical or Material Error
Chapter 143-134.1	Prompt Payment — Construction Contracts
Chapter 159	Local Government Budget and Fiscal Control Act
Chapter 160A	Cities and Towns — Contracts
G.S. 64-26	E-Verify Requirements

FEDERAL TERMS AND CONDITIONS (FAA AIP REQUIREMENTS)

The following Federal Terms and Conditions apply when this contract is funded in whole or in part with Federal Aviation Administration (FAA) Airport Improvement Program (AIP) or Infrastructure Investment and Jobs Act (IIJA) funds. These provisions are required by federal law and must be incorporated into all contracts and subcontracts on AIP-funded projects. Unless otherwise stated, these provisions flow down to all subcontracts and sub-tier agreements.

1. DAVIS-BACON PREVAILING WAGES (40 U.S.C. §§ 3141-3147) — Construction > $2,000

All laborers and mechanics employed on this project shall be paid prevailing wages as determined by the U.S. Department of Labor. The applicable wage determination (DOL Wage Determination Nos. NC20260081 and NC20260090, dated 05/18/2026 is attached hereto in **Section D** and is incorporated herein by reference. Weekly certified payrolls on Optional Form WH-347 shall be submitted weekly to the City. See Construction Contract Article 17.1 for full mandatory clause text per 29 CFR § 5.5.

2. CONTRACT WORKHOURS AND SAFETY STANDARDS ACT (40 U.S.C. §§ 3702 & 3704) — Contracts > $100,000

No laborer or mechanic shall work more than 40 hours per workweek without overtime at 1.5 times the basic rate. Liquidated damages of $33 per worker per calendar day apply to violations. See Construction Contract Article 17.2 for full mandatory clause text.

3. COPELAND 'ANTI-KICKBACK' ACT (18 U.S.C. § 874; 40 U.S.C. § 3145) — Construction > $2,000

Inducing any employee to give up any part of their compensation is strictly prohibited. Weekly statements on wages paid must be submitted. See Construction Contract Article 17.4.

4. BUY AMERICAN PREFERENCE (49 U.S.C. § 50101; BABA; EO 14005) — All AIP Construction

All iron, steel, manufactured goods, and construction materials used on this AIP-funded project must be produced in the United States. The FAA Buy American Preference Certification (Appendix E) must be submitted with the bid as a condition of responsiveness. False certifications are subject to prosecution under 18 U.S.C. § 1001.

5. CIVIL RIGHTS — GENERAL (49 U.S.C. § 47123) — All Contracts — MANDATORY TEXT

In all its activities within the scope of its airport program, the Contractor agrees to comply with pertinent statutes, Executive Orders,

and such rules as identified in Title VI List of Pertinent Nondiscrimination Acts and Authorities to ensure that no person shall, on the grounds of race, color, national origin, creed, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

The above provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract.

6. DISADVANTAGED BUSINESS ENTERPRISE (49 CFR Part 26; 49 U.S.C. § 47113)

See Section A — SDBE Program & Affidavits, Paragraph C (DBE) for placeholder language pending the City's FAA-approved DBE program. The mandatory 49 CFR § 26.13 assurance is incorporated in the Construction Contract Article 7.8.1 and must flow down verbatim to all subcontracts.

7. DEBARMENT AND SUSPENSION (2 CFR Parts 180 & 1200) — Contracts > $25,000

The Debarment Statement in Section A certifies compliance. The Contractor must also verify all subcontractors at every tier against SAM.gov before executing subcontracts exceeding $25,000. See Construction Contract Article 17.10.

8. LOBBYING RESTRICTIONS (31 U.S.C. § 1352) — Contracts > $100,000

No federal appropriated funds shall be paid to any person for influencing or attempting to influence federal officials regarding this contract. If any non-federal funds have been paid for such purposes, complete and submit Standard Form-LLL. See Construction Contract Article 17.16.

9. PROHIBITION ON COVERED UAS (FAA Reauthorization Act of 2024, P.L. 118-63, Section 936; 49 U.S.C. § 44801 Note)— All AIP Contracts

Federal funds may not be used to purchase or operate unmanned aircraft systems manufactured or assembled by covered foreign entities. See Construction Contract Article 17.26.

10. SUBCONTRACTOR FLOW-DOWN (2 CFR Part 200; 49 CFR Part 26)

The prime Contractor is solely responsible for ensuring that all applicable FAA federal provisions are incorporated into every subcontract and sub-tier agreement. See Construction Contract Article 17.27 for the full flow-down obligations clause.

REQUIREMENTS OF THE WORK

1. CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the final acceptance of the project by the Engineer, the work shall be under the charge and care of the Contractor, who shall take every precaution against injury or damage to same or any part thereof by the action of the elements or from any other cause, whether arising from the execution or non-execution of the work. The Contractor will be held responsible for the protection and restoration, at its expense, of property monuments or markers, buildings, fences, and all utility installations affected in the prosecution of the work.

2. PROSECUTION OF WORK

The Contractor will be required to execute the work in a continuous and uninterrupted manner from the time it begins the work until completion and final acceptance. The Contractor is not permitted to suspend operations except for reasons beyond its control and/or where the Engineer has authorized a suspension in writing. Should prosecution of the work be discontinued by the Contractor, the Contractor shall notify the Engineer at least twenty-four (24) hours before resuming operations.

3. TRAFFIC CONTROL

The Contractor shall maintain traffic flow and pedestrian access as required by the City, NCDOT, and other authorities having jurisdiction. Traffic control plans require City approval before implementation. The Contractor shall provide flaggers and implement all necessary traffic control devices in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

4. CONTRACTOR'S SAFETY PLAN

The Contractor shall establish and maintain a comprehensive safety program complying with the Occupational Safety and Health Act of 1970 and all applicable OSHA regulations (29 C.F.R. Part 1926) and North Carolina Department of Labor safety requirements. The Contractor shall submit a Site Safety Plan to the City within ten (10) days of Notice to Proceed.

5. CLEANING UP

The Contractors shall keep the building and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site from time to time or when directed to do so by the Engineer. All debris must be maintained within the site perimeter. Any debris, soil, etc., leaving the site must be cleaned immediately. Before final inspection and acceptance of the work, each Contractor shall clean its portion of the work — including glass, hardware, fixtures, masonry, tile — and completely prepare the site for use by the City.

6. ROYALTIES, LICENSES AND PATENTS

It is the intention of the contract documents that the work covered herein will not constitute infringement of any patent. The Contractor must notify the City immediately of any claim or infringement of any patent in connection with the performance of this contract. The Contractor shall pay all royalties and/or license fees required on account of patented articles or processes. The Contractor shall hold and save harmless the City, its officers, agents, servants, and employees from any liability for the use of any

patented or unpatented invention, article, or process furnished or used in the performance of this contract, excepting patented articles designated by the City in its specifications.

7. GUARANTEE

The Contractor(s) shall guarantee and warrant all labor and material for the project against defects due to faulty material, workmanship, and/or negligence for a period of ONE (1) YEAR from the date of final inspection of the project. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, the manufacturer's warranty shall apply for that particular item. The Contractor shall respond to any repair request from the City within forty-eight (48) hours of notice. The Contractor shall replace defective materials, equipment, or workmanship without cost to the City within the stipulated guarantee period.

8. CONTRACTOR'S RIGHT TO STOP WORK / TERMINATE CONTRACT

Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three (3) months due to causes beyond the fault or control of the Contractor, or if the City should fail or refuse to make payment on account of a certificate issued by the Engineer within thirty (30) days after receipt of same, then the Contractor, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the City and the Engineer, may suspend operations or terminate the contract. The City shall be liable to the Contractor for the cost of all materials delivered and work performed on this contract.

9. UTILITY CONFLICTS

It shall be the responsibility of the Contractor to contact all affected utility owners and determine the precise location of all utilities prior to beginning construction. Utility owners shall be contacted a minimum of forty-eight (48) hours prior to the commencement of operations. The Contractor shall contact NC 811 at least three (3) business days before excavation. Special care shall be used in working around or near existing utilities to provide uninterrupted service. In the event that any utility service is interrupted, the Contractor shall notify the utility owner immediately and shall cooperate in the restoration of service in the shortest time possible. Existing fire hydrants shall be kept accessible to the fire department at all times.

SECTION C – CONTRACT AWARD DOCUMENTS AND EXHIBITS

The following documents are executed at contract award and become exhibits to the Construction Contract. They are labeled to match the exhibit numbering in the City of Fayetteville General Construction Contract template. None of these documents are submitted with the bid; they are required from the successful bidder within the timeframes specified. Cross-reference: Construction_Contract_FAA.docx.

CONSTRUCTION CONTRACT

PLACEHOLDER: DRAFT CONSTRUCTION AGREEMENT (Incorporated as the Contract Document — Not a Numbered Exhibit)

Insert the City of Fayetteville General Construction Contract (FAA-compliant version) here. Cross-reference: City of Fayetteville Construction_Contract_FAA.docx. Note: Some contract provisions in this RFP (bonds, insurance, DBE, FAA provisions) are also addressed in the contract template. Verify consistency before issuing to avoid conflicting requirements.

CITY OF FAYETTEVILLE

GENERAL CONSTRUCTION CONTRACT

Project Name/Description:	
Site Address:	
City Department:	
Vendor Name:	
Total Contract Amount:	$
Funding Source:	☐ Federally-Funded ☐ General Fund Balance
Federal Funds Amount:	$
General Fund Amount:	$
Federal Agency (if applicable):	
Davis-Bacon Act Applies:	☐ Yes ☐ No
Bid Proposal Date:	
Council Approval Date:	
Contract Start Date:	
Projected Completion Date:	

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This contract ("Contract") is made this _____ day of _____**, 2026** by _____, hereinafter called **Contractor**, and the **City of Fayetteville, North Carolina**, hereinafter called **City**. Collectively, Contractor and City shall be referred to as Parties.

WITNESSETH

WHEREAS, a Contract for _____ has recently been awarded to Contractor by City for $_____, a sum equal to the aggregate cost of the work to be done and for labor, materials, equipment, apparatus, and supplies furnished at the prices and rates respectively named in the Proposal/Bid attached herewith as Exhibit 1;

AND WHEREAS, it was provided in said Award that a formal contract would be executed by and between Contractor and City, evidencing the terms of said Award, and agreement on a date to be specified in a written order of City and would complete all work as outlined under Special Provisions and Standard Specifications (Exhibit 2) and would complete all work as required within the schedule as shown in the Special Provisions.

NOW, THEREFORE, Contractor does hereby covenant and agree with City that it will faithfully perform and execute such work and furnish such labor, materials, equipment, apparatus and supplies, in accordance with each and every one of the conditions, covenants, stipulations, terms, and provisions contained in said Specifications and Provisions and in accordance with the Plans, at and for a sum equal to the aggregate cost of the work done and labor, materials, equipment, apparatus and supplies furnished at the prices and rates respectively named therefore in the proposal attached thereto, and will well and faithfully comply with and perform each and every obligation imposed upon it by said Plans and Specifications and the terms of said Award.

ARTICLE 1: PAYMENT OBLIGATIONS

Contractor shall promptly make payments to all persons supplying materials in the execution of the work and to all laborers and others employed thereon.

Contractor shall furnish with each pay application on City provided forms, beginning not later than the second application for payment, an affidavit certifying the total cost of materials and North Carolina Sales Tax paid on such materials which are included in the application for payment.

ARTICLE 2: CONTRACTOR RESPONSIBILITIES AND LIABILITY

2.1 Property Damage

Contractor shall be responsible for all damages to property of the City of Fayetteville, North Carolina, that may be consequent upon the normal procedure of its work or that may be caused by or result from the negligence of Contractor, its employees or agents, during the progress of or connected with the execution of the work, whether within the limits of the work or elsewhere. Contractor must restore all property so injured to a condition as good as it was when Contractor entered upon the work.

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2.2 General Liability

Contractor shall furthermore be responsible for and required to make good at its expense any and all damages of whatever nature to persons or property arising during the period of the Contract, caused by carelessness, neglect, or want of due precaution on the part of Contractor, its agents, employees or workmen.

2.3 Indemnification

To the extent permitted by law, Contractor shall indemnify and save harmless the City of Fayetteville, North Carolina, and the officers and agents thereof from all claims, suits, and proceedings of every name and description which may be brought against the City of Fayetteville, North Carolina, or the officers and agents thereof, for or on account of any injuries or damages to persons or property received or sustained by any person or persons, firm or corporation, or by or in consequence of any materials used in said work or by or on account of any improper material or workmanship in its construction, or by or on account of any accident, or of any other act or omission of Contractor, its agents, employees, servants or workmen.

Contractor assumes entire responsibility and liability for losses, expenses, demands and claims in connection with or arising out of any injury, or alleged injury (including death) to any person, or damage, or alleged damage, to property of the City or others sustained or alleged to have been sustained in connection with or to have arisen out of or resulting from the negligence of the Contractor, its subcontractors, agents, and employees, in the performance of the work/service set forth in the Standard Specifications and Special Provisions, and any changes, addenda, or modifications including losses, expenses or damages sustained by the City, and agrees to indemnify and hold harmless the City, its officials, employees or volunteers from any and all such losses, expenses, damages, demands and claims and agrees to defend any suit or action brought against them, or any of them, based on any such alleged injury or damage, and to pay all damages, cost and expenses in connection therewith or resulting therefrom.

Indemnification by the Contractor does not constitute a waiver of the City's governmental immunity in any respect under North Carolina law.

2.4 Subcontracts and Contingent Assignment

2.4.1 Subcontractual Relations and Flow-Down

(a) By appropriate written agreement, Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to Contractor by the terms of the Contract Documents and to assume toward Contractor all obligations and responsibilities, including responsibility for safety, that Contractor assumes toward City under the Contract Documents. Each subcontract agreement shall preserve and protect City's rights under the Contract Documents with respect to the Work to be performed by the Subcontractor. Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors.

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(b) All subcontracts shall include substantially the following provisions:

1. **Flow-Down of Terms**. To the extent of the work to be performed by Subcontractor: (A) Subcontractor is bound to Contractor by the terms of the Contract between City and Contractor, and (B) Subcontractor assumes toward Contractor all obligations and responsibilities that Contractor assumes toward City under the Contract. City's rights under the Contract with respect to the Work to be performed by Subcontractor are preserved and protected. City is an intended third-party beneficiary of this subcontract.
2. **Obligation to Continue Performance.** If Contractor is terminated by City, and even if Contractor defaults in a manner that would give Subcontractor the right to terminate this subcontract, Subcontractor agrees that upon written request by City, a substitute contractor, or any surety obligated under bonds relating to the Contract, Subcontractor will continue to perform its obligations under this subcontract on the same terms and conditions for and on account of City, such substitute contractor, or the surety. If requested, Subcontractor will execute a separate document evidencing this commitment. Assignment is subject to the prior rights of the surety. City shall be responsible to Subcontractor only for those obligations of Contractor that accrue after City exercises rights under this provision.

2.4.2 Contingent Assignment of Subcontracts

(a) Assignment to City. Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to City, subject to the following conditions:

1. Effectiveness. Assignment becomes effective only upon:
   a. Termination of this Contract by City for cause pursuant to 23.2; and
   b. City's written acceptance of the specific subcontract(s) by notice to Contractor and the affected Subcontractor(s).
2. Surety Priority. Assignment is subject to the prior rights of any surety obligated under payment and performance bonds provided pursuant to N.C. Gen. Stat. § 44A-26.

(b) City's Rights Upon Assignment. Upon accepting assignment of a subcontract, City assumes Contractor's rights and obligations under that subcontract. City may further assign the subcontract to a successor contractor but shall remain legally responsible for the successor contractor's obligations.

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(c) Equitable Adjustment. If work under an assigned subcontract has been suspended for more than thirty (30) days following Contract termination, the Subcontractor's compensation shall be equitably adjusted for any increase in direct costs resulting from the suspension.

(d) Production of Subcontract Documents. Upon City's request at any time, Contractor shall promptly provide complete copies of all subcontract agreements, purchase orders, and related documents, including all terms, conditions, pricing, and delivery schedules.

ARTICLE 3: CONTRACTOR LICENSES, PERMITS, AND REGULATORY COMPLIANCE

3.1 North Carolina General Contractor License

Contractor warrants and certifies that it possesses a valid and current North Carolina General Contractor License issued by the North Carolina Licensing Board for General Contractors (NCLBGC) as required by N.C. Gen. Stat. § 87-1 et seq.

3.1.1 License Classification

Contractor's license classification is: _____ (Building Contractor / Residential Contractor / Specialty Contractor / Highway Contractor / Public Utilities Contractor)

3.1.2 License Limitation

Contractor's license limitation is: _____ (Limited / Intermediate / Unlimited)

- Limited License: Projects up to $750,000
- Intermediate License: Projects up to $1,500,000
- Unlimited License: No monetary restrictions

Contractor certifies that the contract amount does not exceed the monetary limitation of its license

.3.1.3 License Number and Qualifier

- North Carolina General Contractor License Number: _____
- Qualifying Party Name: _____
- Qualifier License Number: _____

3.1.4 Maintenance of License

Contractor shall maintain its General Contractor License in good standing throughout the duration of this Contract. Contractor shall immediately notify the City of any suspension,

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revocation, or limitation placed on its license. Failure to maintain a valid license shall constitute a material breach of this Contract and grounds for immediate termination.

3.2 Specialty Trade Licenses

In addition to the General Contractor License, Contractor shall ensure that all work requiring specialty trade licenses is performed by properly licensed contractors, including but not limited to:

(a) **Electrical Work**: All electrical work shall be performed by contractors licensed by the North Carolina Board of Examiners of Electrical Contractors;

(b) **Plumbing, Heating, and Fire Sprinkler Work**: All plumbing, HVAC, and fire sprinkler work shall be performed by contractors licensed by the North Carolina State Board of Examiners of Plumbing, Heating, and Fire Sprinkler Contractors;

(c) **Other Specialty Contractors**: All other specialty work shall be performed by appropriately licensed contractors as required by North Carolina law.

3.3 Corporate Registration Requirements

If Contractor is a corporation, Contractor certifies compliance with the following:

(a) **In-State Corporations**: Contractor has provided proof of registration via Articles of Incorporation filed with the North Carolina Secretary of State;

(b) **Out-of-State Corporations**: Contractor has obtained and provided a Certificate of Authority from the Corporations Division of the NC Secretary of State to transact business in North Carolina;

(c) **Annual Reports**: Contractor agrees to maintain current corporate status by filing annual reports with the North Carolina Secretary of State as required by law.

3.4 Building Permits and Inspections

3.4.1 Permit Responsibility

Contractor shall obtain and pay for all building permits, trade permits, and other permits required by local, state, and federal authorities having jurisdiction over the work. Contractor shall not commence work until all required permits have been obtained and posted at the work site.

3.4.2 Permit Posting

All permits shall be prominently displayed at the work site and shall remain posted throughout the duration of construction.

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3.4.3 Inspection Scheduling

Contractor shall schedule all required inspections with the appropriate authorities in a timely manner to avoid delays in the work. Contractor shall be present or have a qualified representative present for all inspections.

3.4.4 Compliance with Code Requirements

All work shall comply with:

- North Carolina State Building Code
- North Carolina Residential Building Code (if applicable)
- All applicable local building codes and ordinances
- All applicable federal regulations

3.4.5 Certificate of Occupancy

Contractor shall obtain all required Certificates of Occupancy or Certificates of Completion from the appropriate authorities prior to requesting Final Completion under this Contract.

3.5 Professional Registration

Any design work, engineering work, or professional services required under this Contract shall be performed only by individuals or firms holding current registration/licensure with the appropriate North Carolina professional licensing boards, including:

- North Carolina Board of Architecture
- North Carolina Board of Examiners for Engineers and Surveyors
- Other applicable professional boards

3.6 Federal and State Tax Compliance

Contractor certifies that it is current on all federal and state tax obligations and shall remain current throughout the duration of this Contract. Contractor shall provide evidence of tax compliance upon request by the City.

3.7 Compliance with OSHA and Safety Requirements

Contractor shall comply with all applicable Occupational Safety and Health Administration (OSHA) regulations and North Carolina Department of Labor safety requirements. Contractor shall maintain all required safety programs and documentation.

3.8 Environmental Permits

Contractor shall obtain all required environmental permits, including but not limited to:

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- Stormwater permits (NPDES)
- Erosion and sediment control permits
- Air quality permits
- Wetlands permits
- Any other environmental permits required by federal, state, or local authorities

3.9 Right to Verify

The City reserves the right to verify all licenses, permits, registrations, and certifications required under this Article. Failure to maintain any required license, permit, or certification shall constitute a material breach of this Contract.

3.10 Costs

All costs associated with obtaining and maintaining licenses, permits, registrations, and certifications required under this Article shall be borne solely by Contractor and are deemed included in the Contract amount.

ARTICLE 4: INSURANCE REQUIREMENTS

At all times during performance of services under this Contract, Contractor agrees to purchase and maintain the following insurance policies:

4.1 Commercial General Liability Insurance

Commercial General Liability Insurance with combined single limits of $1,000,000.00 coverage for each occurrence with a general aggregate of $2,000,000.00, designating the City as an additional insured and which said insurance provides Contractor with insurance for contractual liability which Contractor has assumed pursuant to the terms of this Agreement. Said insurance coverage shall be underwritten by an insurance company authorized to do business in the State of North Carolina by the North Carolina Department of Insurance, with an A.M. Best rating of either Superior (A++ or A+) or Excellent (A or A-).

4.2 Automobile Liability Insurance

Automobile liability insurance with $1,000,000.00 combined single limit for each accident covering bodily injury and property damage.

4.3 Worker's Compensation Insurance

Worker's Compensation Insurance as provided by North Carolina law which said policy shall also afford coverage to Contractor for employer's liability. Contractor shall provide adequate coverage for the protection of employees not otherwise protected by a worker's compensation policy.

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4.4 Contractual Liability Insurance

As an integral part of this Agreement, Contractor agrees to purchase and maintain during the life of this Agreement contractual liability insurance in the amount required in the general liability insurance requirements and to furnish proper evidence thereof.

ARTICLE 5: PAYMENT AND PERFORMANCE BONDS

5.1 Bond Requirements Pursuant to N.C. Gen. Stat. § 44A-26

When the total amount of construction contracts awarded for any one project exceeds three hundred thousand dollars ($300,000), Contractor shall furnish to the City, as required by North Carolina General Statutes § 44A-26, the following bonds for any contract exceeding fifty thousand dollars ($50,000):

5.1.1 Performance Bond

A performance bond in the amount of one hundred percent (100%) of the construction contract amount, conditioned upon the faithful performance of the contract in accordance with the plans, specifications, and the terms of this Contract. The performance bond shall be for the protection of the City and shall secure the faithful performance of all duties and obligations of Contractor under this Contract.

5.1.2 Payment Bond

A payment bond in the amount of one hundred percent (100%) of the construction contract amount, conditioned upon the prompt payment for all labor or materials for which Contractor or subcontractor is liable. The payment bond shall be solely for the protection of the persons furnishing materials or performing labor for which Contractor, subcontractor, or construction manager at risk is liable.

5.1.3 In the discretion of the City, performance and payment bonds may be required on construction contracts below the statutory threshold amounts.

5.2 Surety Requirements

The performance bond and the payment bond shall be executed by one or more surety companies legally authorized to do business in the State of North Carolina and shall become effective upon the awarding of the construction contract. All surety companies shall maintain an A.M. Best rating of either Superior (A++ or A+) or Excellent (A or A-).

5.3 Bond Forms

The payment and performance bonds required under this Contract shall follow the forms established under N.C. Gen. Stat. § 44A-33, or such other forms as may be approved in writing by the City. Bond Forms are attached as Exhibit 3.

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5.4 Certified Copies of Bonds

It shall be the duty of the City to provide any person entitled thereto under N.C. Gen. Stat. § 44A-31 with a certified copy of the payment bond and the construction contract upon not less than ten (10) days' notice and request. The City may require a reasonable payment for the actual cost of furnishing the certified copy.

5.5 Contractor's Duty to Provide Bond Copies

Contractor shall furnish a copy of the payment bond to any claimant within seven (7) days of receipt of a written request, as required by N.C. Gen. Stat. § 44A-27(b). Failure to furnish the bond as requested shall suspend the obligation of the subcontractor to furnish the Notice of Public Subcontract until the request is complied with.

5.6 Incorporation of Contract Documents

It is agreed and understood that the Invitation for Bids, Proposal, Standard Specifications, Special Provisions, and the enumerated addenda and drawings are parts and parcels of this Contract to the same extent as if incorporated herein in full.

5.7 Additional Security

It is further mutually agreed that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, City shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover performance and payment of the work, Contractor shall, at its expense, within five (5) days after the receipt of notice from the City so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to City. In such event, no further payment to Contractor shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to City.

ARTICLE 6: TIME OF COMPLETION AND LIQUIDATED DAMAGES

6.1 Contract Time

Contractor agrees to commence work under this Contract on the date specified in the Notice to Proceed issued by the City and to complete all work within _____ calendar days from said date, or by _____***, 2026***, whichever occurs first.

Time is of the essence in the performance of this Contract.

6.2 Substantial Completion

Substantial Completion shall mean the stage in the progress of the work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so

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that the City can occupy or utilize the work for its intended use. The date of Substantial Completion shall be established by the City in the Certificate of Substantial Completion and, where applicable, supported by a Temporary Certificate of Occupancy (TCO).

6.3 Liquidated Damages for Delay

The parties acknowledge and agree that:

(a) The actual damages that the City will sustain in the event of delay in completion of the work are difficult to ascertain with certainty at the time of entering into this Contract;

(b) The liquidated damages amount set forth herein represents a reasonable estimate of the damages which would probably be caused by breach of the completion deadline and are not intended as a penalty; and

(c) The liquidated damages include but are not limited to costs associated with extended project administration, extended oversight and inspection services, delay in availability of facilities for public use, and other consequential damages reasonably anticipated from delayed completion.

Accordingly, if Contractor fails to achieve Substantial Completion of the work within the time specified in Section 6.1, or within such extended time as may be granted pursuant to Section 6.5, Contractor shall pay to the City, not as a penalty but as liquidated damages for breach of contract, the sum of $_____ for each calendar day that Substantial Completion is delayed beyond the required completion date.

6.4 Deduction of Liquidated Damages

The City may deduct the amount of liquidated damages from any amounts due or to become due to Contractor under this Contract. The City's right to assess and collect liquidated damages shall not be exclusive and shall be in addition to any other rights or remedies available to the City under this Contract or at law.

6.5 Extensions of Time

Contractor shall be entitled to an extension of the Contract Time for delays in completion of the work caused by:

(a) Acts or omissions of the City or its agents, employees, or separate contractors;

(b) Changes in the work ordered by the City;

(c) Unusually severe weather conditions not reasonably anticipated;

(d) Force majeure events as defined in Section 28.2;

(e) Delays caused by labor disputes beyond Contractor's control;

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(f) Delays caused by fire, flooding, epidemics, quarantine restrictions, or acts of government;

(g) Any other causes beyond the reasonable control of Contractor and not attributable to Contractor's fault or negligence.

6.6 Procedure for Requesting Time Extensions

Contractor shall submit a written request for extension of time to the City within ten (10) calendar days after the occurrence of the event causing the delay. The request shall include:

(a) A description of the cause of delay;

(b) The date the delay commenced and the anticipated duration;

(c) Documentation supporting the claim that the delay was beyond Contractor's reasonable control;

(d) The number of days of extension requested;

(e) Any supporting documentation, including contemporaneous records, schedules, and correspondence.

Failure to provide timely notice as required herein may result in waiver of the claim for time extension, unless the City determines that circumstances prevented timely notice.

6.7 Apportionment of Delays

In the event that delays to project completion are caused by both the City and Contractor (concurrent or mutual delays), liquidated damages shall be apportioned between the parties based upon their respective degrees of responsibility for the delays. The burden of proving the extent and allocation of concurrent delays shall rest with Contractor. This apportionment provision is essential to the enforceability of the liquidated damages clause and is included in accordance with North Carolina law.

6.8 No Waiver

The City's failure to assess liquidated damages for any period of delay shall not constitute a waiver of the City's right to assess liquidated damages for any other period of delay or for continued delays.

6.9 Final Completion

Final Completion shall occur when all work under the Contract is fully completed in accordance with the Contract Documents, all required documentation has been submitted, all punch list items have been completed, and the City has accepted the work as complete. Additional liquidated damages may be assessed for delays in achieving Final Completion beyond any extended deadlines, at a rate to be specified in the Special Provisions.

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ARTICLE 7: SMALL BUSINESS AND DISADVANTAGED BUSINESS ENTERPRISE PROGRAMS

7.1 Applicability of DBE Requirements

If this Contract involves federal funding from the U.S. Department of Transportation (USDOT) or other federal agencies requiring Disadvantaged Business Enterprise (DBE) participation, Contractor agrees to comply with all applicable federal DBE requirements as set forth in 49 C.F.R. Part 26, as amended, and the City's approved DBE program.

7.2 DBE Program Compliance Under October 3, 2025 Interim Final Rule

Contractor acknowledges that effective October 3, 2025, USDOT removed race- and sex-based presumptions of social and economic disadvantage from the DBE program. All DBE participation must now be based on individualized determinations of social and economic disadvantage without regard to race or sex.

7.2.1 Current Certification Requirements

Any DBE firm utilized by Contractor to meet DBE goals must be properly certified under the revised standards requiring:

(a) Individualized demonstration of social and economic disadvantage based on the owner's personal experiences and circumstances within American society, without regard to race or sex;

(b) A personal narrative establishing the existence of disadvantage based on specific instances of economic hardship, systemic barriers, and denied opportunities that blocked the owner's progress or success in education, employment, or business, including getting financing on terms available to another person who had advantages and was similarly situated;

(c) Current certification through the North Carolina Unified Certification Program (NCUCP) or other applicable state or regional Unified Certification Program (UCP);

(d) Compliance with personal net worth and business size standards as established in 49 C.F.R. Part 26.

.2.2 Recertification Process

Contractor acknowledges that all previously certified DBE firms are subject to mandatory reevaluation and recertification under the new individualized standards. Until a DBE firm completes recertification under the October 3, 2025 rule:

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(a) The firm's participation may not be counted toward DBE goals on new contracts;

(b) Contractor bears the risk of utilizing firms whose certifications may be decertified during the reevaluation process;

(c) Contractor must verify current certification status with the NCUCP before executing subcontracts with DBE firms.

7.2.3 DBE-Neutral and DBE-Conscious Measures

Consistent with the revised federal regulations, the terms "race-neutral" and "race-conscious" are replaced with "DBE-neutral" and "DBE-conscious" measures. The City's DBE program will utilize DBE-neutral measures to the maximum extent feasible before implementing any DBE-conscious contract goals.

7.3 Contract-Specific DBE Goals

If a specific DBE participation goal has been established for this Contract, that goal is: _____ %.

Contractor must meet this goal through one or more of the following methods:

(a) By subcontracting a portion of the work to qualified, certified DBE firms;

(b) By demonstrating good faith efforts to meet the goal as defined in 49 C.F.R. § 26.53;

(c) By obtaining a waiver from the City based on documented unavailability of qualified DBE firms.

7.4 Good Faith Efforts

If Contractor is unable to meet the stated DBE goal, Contractor must demonstrate that it made adequate good faith efforts to meet the goal. Good faith efforts include, but are not limited to:

(a) Soliciting through all reasonable and available means the interest of certified DBEs;

(b) Attending pre-bid meetings to inform DBEs of contracting and subcontracting opportunities;

(c) Providing interested DBEs with adequate information about plans, specifications, and requirements;

(d) Negotiating in good faith with interested DBEs and not rejecting DBEs as unqualified without sound reasons;

(e) Making portions of the work available to DBE firms, including breaking down contracts into economically feasible units;

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(f) Providing assistance in obtaining bonding, lines of credit, or insurance required by the City or Contractor;

(g) Effectively using services of available business assistance organizations.

7.5 North Carolina Small Business Enterprise (SBE) Program

If this Contract is subject to North Carolina state requirements (NCGS § 143-128.2 and 01 NCAC 30I), Contractor agrees to comply with applicable Small Business Enterprise program requirements.

7.5.1 NCDOT SBE Program (If Applicable)

For projects administered by or in coordination with the North Carolina Department of Transportation, Contractor acknowledges that businesses with annual gross income exceeding $1,500,000 (exclusive of materials) are not eligible to participate as SBEs under the NCDOT SBE Program.

7.5.2 Statewide NCSBE Program (If Applicable)

For projects subject to the North Carolina Department of Administration's Statewide Small Business Enterprise (NCSBE) Program, eligible businesses must:

(a) Be headquartered in North Carolina;

(b) Have annual net income not exceeding $1,500,000 after cost of goods sold is deducted;

(c) Have up to 100 employees;

(d) Maintain current NCSBE certification through the NC Office for Historically Underutilized Businesses (HUB).

7.6 Counting DBE/SBE Participation

DBE and SBE participation will be counted in accordance with the provisions of 49 C.F.R. § 26.55 and applicable state regulations. Only the work actually performed by certified DBE/SBE firms using their own employees, or work that the firm is directly responsible for, will count toward meeting goals.

7.7 Reporting and Record-Keeping Requirements

Contractor shall:

(a) Submit DBE/SBE utilization reports with each monthly payment application, documenting actual payments made to DBE/SBE subcontractors;

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(b) Maintain records demonstrating payments to DBE/SBE firms for three (3) years following final project completion;

(c) Provide copies of executed subcontracts and evidence of payment upon City request;

(d) Immediately notify the City if a DBE/SBE firm is terminated or fails to perform, and document good faith efforts to replace the firm with another qualified DBE/SBE.

7.8 Prohibition Against Discrimination

Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 and NCGS § 143-128.2 in the award and administration of this Contract.

7.8.1 Mandatory DBE Assurance — MANDATORY TEXT (49 CFR § 26.13) — Must Be Included Verbatim in All Subcontracts

The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to: (1) Withholding of payments to the contractor under the contract until the contractor complies; and/or (2) Cancelling, terminating, or suspending a contract, in whole or in part. This assurance must be included verbatim in all subcontracts and sub-tier agreements on this project.

7.9 Prompt Payment to Subcontractors

Contractor agrees to pay all subcontractors, including DBE and SBE subcontractors, for satisfactory performance of their contracts no later than thirty (30) days from Contractor's receipt of payment from the City. Any delay or postponement of payment must be for good cause and with the City's prior written approval.

Contractor further agrees to return any retainage payments to subcontractors within thirty (30) days after the subcontractor's work is satisfactorily completed and accepted by the City.

7.10 Commercially Useful Function

A DBE or SBE performs a commercially useful function when it is responsible for execution of the work and actually performs, manages, and supervises the work involved. To count toward DBE/SBE goals, the firm must carry out its responsibilities by actually performing, managing, and supervising the work with its own workforce.

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7.11 Substitution of DBE/SBE Firms

Contractor shall not terminate or substitute a DBE or SBE firm listed in the original proposal without the City's prior written consent. Requests for substitution must include:

(a) Documentation of good cause for the requested substitution;

(b) Written notice provided to the DBE/SBE firm with an opportunity to respond;

(c) Documentation of good faith efforts to find an acceptable replacement DBE/SBE firm, if applicable.

7.12 Sanctions for Non-Compliance

Failure to comply with DBE/SBE requirements may result in:

(a) Withholding of progress payments;

(b) Suspension or termination of the Contract;

(c) Debarment from future City contracts;

(d) Such other remedies as may be available under federal or state law.

7.13 Federal Funding Acknowledgment

If this Contract is funded in whole or in part with federal funds, Contractor acknowledges that federal requirements take precedence over state and local requirements to the extent of any conflict, and that the City's DBE program operates in compliance with USDOT requirements.

ARTICLE 8: NON-DISCRIMINATION

It is further agreed that the Contractor will not discriminate against any employee or applicant because of race, color, creed, sex, or religion.

8.A General Civil Rights Provisions — MANDATORY (49 U.S.C. § 47123) — All Contracts Regardless of Funding Source

In all its activities within the scope of its airport program, the Contractor agrees to comply with pertinent statutes, Executive Orders, and such rules as identified in Title VI List of Pertinent Nondiscrimination Acts and Authorities to ensure that no person shall, on the grounds of race, color, national origin, creed, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964. The above provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract.

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8.B Title VI — Nondiscrimination Requirements — MANDATORY (49 U.S.C. § 47123; FAA Order 1400.11) — All Contracts

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest, agrees to comply with the following nondiscrimination statutes and authorities, including but not limited to: Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 Stat. 252); 49 CFR Part 21; the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601); Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.); the Age Discrimination Act of 1975 (42 U.S.C. § 6101 et seq.); the Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123); the Civil Rights Restoration Act of 1987 (P.L. 100-259); Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101 et seq.); and Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et seq.). The Contractor will not discriminate on the grounds of race, color, national origin, creed, sex, age, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. In the event of noncompliance, the Sponsor may withhold payments or cancel, terminate, or suspend the contract in whole or in part. The Contractor will include these provisions in every subcontract and purchase order.

8.1 Terminating Illegal Discrimination Certification (For Federally Funded Projects Only)

Contractor certifies that: (i) it does not operate any DEI programs that violate any applicable Federal anti-discrimination laws, (ii) it is compliant in all respects with all applicable Federal anti-discrimination laws material to the government's payment decisions, and (iii) agrees that, if a violation of this certification is found, could lead to liability under the False Claims Act. By signing this Agreement, Contractor further agrees, as an independent obligation, separate and apart from this Agreement, to reimburse the City for any and all damages, costs and attorneys' fees incurred by the City in connection with any claim that this Agreement or any part thereof is void due to Contractor's noncompliance with this certification at any time before or during the term of this Agreement.

ARTICLE 9: CHANGE ORDERS AND CONTRACT MODIFICATIONS

9.1 Authority to Order Changes

The City reserves the right to order changes in the work without invalidating this Contract. Changes in the work may include additions, deletions, or other revisions to the work, with the Contract Sum and Contract Time being adjusted accordingly.

9.2 Change Order Procedure

9.2.1 Written Authorization Required

No changes to the work shall be made unless authorized by a written Change Order Request Form signed by the City. Contractor shall not proceed with any change in the work without

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such written authorization. Any work performed without a fully executed Change Order Request Form shall be at Contractor's sole risk and expense.

9.2.2 Change Order Request

Contractor shall submit a Change Order Request Form within ten (10) calendar days of being directed to perform changed work or within ten (10) calendar days of discovering conditions requiring a change. The request shall include:

(a) Detailed description of the proposed change;

(b) Itemized cost breakdown including labor, materials, equipment, and overhead;

(c) Impact on project schedule;

(d) Supporting documentation (quotes, invoices, time records, etc.); and,

(e) Justification for the change.

9.2.3 Pricing of Changes

Changes in the work shall be priced using one or more of the following methods, in order of preference:

(a) **Lump Sum**: A mutually agreed upon fixed price for the changed work;

(b) **Unit Prices**: Application of unit prices specified in the Contract Documents or as mutually agreed upon;

9.2.4 Prohibition on Cost-Plus-a-Percentage-of-Cost Pricing

Cost-plus-a-percentage-of-cost contracts and subcontracts are prohibited on this project pursuant to 2 CFR Part 200, Appendix II(D). All change orders and modifications to this Contract shall be priced using Lump Sum (Section 9.2.3(a)) or Unit Prices (Section 9.2.3(b)) only. Where a lump sum or unit price cannot be agreed upon prior to performance of the changed work, the City may issue a Construction Change Directive under Section 9.4 directing the Contractor to proceed; in such cases the parties shall negotiate a lump sum settlement supported by documented cost justification upon completion of the changed work. Under no circumstances shall the final settled amount be calculated as a percentage markup applied to total costs incurred.

9.2.5 Time Extensions

If a Change Order affects the Contract Time, Contractor must request a time extension in writing with supporting documentation showing critical path impact. Time extensions shall be granted only for delays to critical path activities.

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9.3 Minor Changes

The City may authorize minor changes in the work that do not involve a change in the Contract Sum or Contract Time through written directive. Contractor shall proceed promptly with such minor changes.

9.4 Construction Change Directives

If the City and Contractor cannot agree on pricing or time for a change, the City may issue a Construction Change Directive ordering Contractor to proceed with the changed work. Contractor shall proceed promptly, and the Change Order shall be resolved through one of the pricing methods in Section 9.2.3.

9.5 Concealed or Unknown Conditions

If Contractor encounters concealed or unknown conditions at the site materially differing from those indicated in the Contract Documents or from those ordinarily encountered in work of this nature, Contractor shall immediately notify the City in writing before disturbing the condition. Failure to provide timely notice may result in waiver of any claim for additional compensation.

9.6 Claims for Additional Cost

Any claim for additional cost must be submitted in writing within ten (10) calendar days after occurrence of the event giving rise to the claim. Claims submitted after ten (10) days may be denied as untimely. Each claim shall include detailed supporting documentation.

9.7 No Oral Modifications

No oral statements, representations, or agreements shall modify or change any provision of this Contract. All modifications must be in writing and signed by authorized representatives of both parties.

ARTICLE 10: PROVISIONS

10.1 Schedule of Values

Within fifteen (15) days of Contract execution, Contractor shall submit a Schedule of Values allocating the entire Contract Sum among the various portions of the work. The Schedule of Values shall be in a form acceptable to the City and shall serve as the basis for monthly progress payments.

10.2 Monthly Payment Applications

10.2.1 Submission Requirements

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Contractor shall submit monthly Applications for Payment on City-approved forms by the _____ day of each month for work completed through the last day of the previous month.

Each Application for Payment shall include:

(a) Updated Schedule of Values showing percentage complete for each line item;

(b) NC Sales Tax Affidavit certifying sales tax paid on materials;

(c) Copies of paid invoices for materials stored on-site;

(d) Waivers of lien from subcontractors and suppliers;

(e) DBE/SBE utilization report (if applicable);

(f) Payroll certifications (if federal funding requires);

(g) Updated project schedule; and,

(h) Any other documentation required by the City.

10.2.2 Stored Materials

Materials suitably stored on-site may be included in progress payments if:

(a) Materials are properly stored and protected;

(b) Contractor provides proof of payment to supplier;

(c) Contractor provides evidence of insurance covering stored materials;

(d) City approves inclusion in advance.

Materials stored off-site shall not be eligible for payment unless specifically approved in writing by the City.

10.3 Retainage

10.3.1 Standard Retainage

The City may retain up to five percent (5%) of the amount of each progress payment as security for Contractor's performance. Retainage shall be held until Final Completion and acceptance of all work, subject to the provisions below.

10.3.2 Reduction of Retainage

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Upon fifty percent (50%) completion of the work, and if the City determines that progress is satisfactory, the City may, in its sole discretion, reduce or eliminate retainage on subsequent progress payments.

10.3.3 Release of Retainage Upon Substantial Completion

Upon Substantial Completion of the work, the City may release all or a portion of retainage, less an amount sufficient to cover the estimated cost of completing punch list items and correcting any deficiencies.

10.3.4 Subcontractor Retainage

Contractor shall return retainage to subcontractors within thirty (30) days after the subcontractor's work is completed and accepted, unless there are specific documented reasons for withholding retainage.

10.4 Payment Timeline

Pursuant to N.C. Gen. Stat. § 143-134.1, the City shall make payment within forty-five (45) days of the later of: (a) receipt of a properly submitted and approved Application for Payment, or (b) the last day of the pay period for which payment is requested. Payment shall constitute acceptance of the work covered by that payment application, subject to correction of defects discovered later and warranty obligations.

10.5 Withholding of Payment

The City may withhold or nullify payment, in whole or in part, to the extent necessary to protect itself from loss due to:

(a) Defective work not remedied;

(b) Claims filed or reasonable evidence that claims will be filed;

(c) Failure to make payments to subcontractors or suppliers;

(d) Reasonable doubt that the Contract can be completed for the unpaid balance;

(e) Damage to the City or another contractor;

(f) Reasonable evidence that work cannot be completed within Contract Time;

(g) Repeated failure to carry out work in accordance with Contract Documents;

(h) Failure to submit required documentation or reports;

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(i) Non-compliance with DBE/SBE requirements (if applicable);

(j) Any other material breach of Contract.

10.6 Final Payment

10.6.1 Final Payment Application

Upon completion of all work, Contractor shall submit a final Application for Payment including:

(a) Final Schedule of Values showing 100% completion;

(b) Complete waivers of lien from all subcontractors and suppliers;

(c) Final NC Sales Tax Affidavit;

(d) Final DBE/SBE utilization report (if applicable);

(e) All warranties and guarantees;

(f) As-built drawings and O&M manuals;

(g) Certificates of Occupancy and all required permits;

(h) Consent of surety to final payment;

(i) Affidavit that all payrolls, materials, and other indebtedness have been paid;

(j) Any other closeout documentation required.

10.6.2 Final Payment Processing

Final payment shall be made within forty-five (45) days after completion of all work and receipt of all required documentation. Acceptance of final payment shall constitute a waiver of all claims by Contractor except those previously made in writing and still unsettled.

10.7 Interest on Late Payments

Pursuant to N.C. Gen. Stat. § 143-134.1, if the City fails to make payment within the time specified in Section 10.4 and through no fault of Contractor, the City shall pay interest on the unpaid amount at the rate of twelve percent (12%) per annum from the date payment is due until payment is made.

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10.8 Prompt Payment to Subcontractors

Pursuant to N.C. Gen. Stat. § 143-134.1, Contractor shall pay each subcontractor and supplier within seven (7) days of receipt of payment from the City for work performed by that subcontractor or for materials supplied. If Contractor fails to make timely payment, Contractor shall pay interest to the subcontractor or supplier at the rate of twelve percent (12%) per annum on the unpaid amount. Failure to make prompt payment may result in withholding of future payments to Contractor.

ARTICLE 11: PROJECT SCHEDULE AND TIME MANAGEMENT

11.1 Construction Schedule Submission

Within fifteen (15) days of receiving Notice to Proceed, Contractor shall submit a detailed construction schedule in Critical Path Method (CPM) format showing:

(a) All activities necessary to complete the work;

(b) Sequential relationships and dependencies;

(c) Duration of each activity;

(d) Critical path through the project;

(e) Major milestones and completion dates;

(f) Long-lead procurement items;

(g) Required submittals and shop drawing dates;

(h) Coordination with other contractors or occupants (if applicable).

11.2 Schedule Format and Software

The schedule shall be prepared using industry-standard scheduling software (Primavera P6, Microsoft Project, or as approved by City) and submitted in both electronic and hard copy formats.

11.3 Schedule Updates

Contractor shall submit updated schedules monthly with each Application for Payment, showing:

(a) Progress achieved to date;

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(b) Changes to sequencing or logic;

(c) Impact of any delays;

(d) Recovery plans for behind-schedule activities;

(e) Revised completion date if different from Contract Time.

11.4 Schedule Review and Approval

The City's review and approval of the schedule does not relieve Contractor of responsibility for completing work within the Contract Time. Schedule approval does not constitute acceptance of means, methods, or sequences of construction.

11.5 Recovery Schedule

If at any time Contractor falls behind schedule, Contractor shall submit a recovery schedule showing how Contractor will complete the work within the Contract Time. Recovery measures shall be at Contractor's expense unless the delay was caused by the City.

11.6 Notice to Proceed

Contractor shall not commence work until receiving written Notice to Proceed from the City. The Contract Time shall commence on the date specified in the Notice to Proceed.

ARTICLE 12: SUBMITTALS, SHOP DRAWINGS, AND PRODUCT DATA

12.1 Submittal Requirements

Contractor shall submit shop drawings, product data, samples, and other submittals as required by the Contract Documents for review and approval before:

(a) Procuring materials;

(b) Fabricating components;

(c) Commencing any portion of work requiring submittals.

12.2 Submittal Schedule

Contractor shall submit a Submittal Schedule within fifteen (15) days of Contract execution, coordinated with the construction schedule, showing:

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(a) Each required submittal;

(b) Anticipated submission date;

(c) Required review time;

(d) Impact on construction schedule.

12.3 Submittal Procedures

12.3.1 Format and Content

All submittals shall:

(a) Be clearly marked with project name, submittal number, and specification section;

(b) Highlight deviations from Contract Documents;

(c) Include manufacturer's data and certifications;

(d) Be submitted in the quantity specified (typically 3 copies plus electronic);

(e) Include Contractor's stamp of review and approval.

12.3.2 Review Time

The City shall be allowed fifteen (15) business days for review of submittals unless a different time is specified. Review time shall be calculated from receipt of properly formatted submittals.

12.3.3 Resubmittals

If submittals are rejected or require revision, Contractor shall make corrections and resubmit within ten (10) days. Each resubmittal restarts the review period.

12.4 City Review

City review of submittals is for general conformance with design concept only. Review does not:

(a) Relieve Contractor of responsibility for errors or omissions;

(b) Constitute approval of means, methods, or safety procedures;

(c) Relieve Contractor of responsibility for dimensions or quantities;

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(d) Constitute acceptance of deviations unless specifically noted in writing.

12.5 Samples

When required, Contractor shall submit samples for City approval before purchasing or installing materials. Approved samples shall be retained at the site for comparison with installed work.

12.6 Submittals for Information Only

Certain submittals may be designated "For Information Only" and do not require formal approval but must still be submitted per the schedule.

ARTICLE 13: SITE MANAGEMENT AND WORKING CONDITIONS

13.1 Site Access and Control

13.1.1 Site Possession

Upon issuance of Notice to Proceed, Contractor shall have full possession of the site except for portions specifically excluded in the Contract Documents. The City reserves the right to occupy portions of the work during construction.

13.1.2 Site Security

Contractor shall:

(a) Maintain site security to prevent unauthorized access;

(b) Provide temporary fencing if required;

(c) Be responsible for loss or damage to materials and equipment;

(d) Maintain control of all personnel on site.

13.2 Construction Signs

Contractor shall provide and maintain project signage as required by the City, including:

(a) Project identification signs per City specifications;

(b) Safety and warning signs as required by OSHA;

c) Traffic control signs as required by permits;

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(d) "No Trespassing" signs if required.

13.3 Working Hours

13.3.1 Standard Hours

Normal working hours shall be Monday through Friday, 7:00 AM to 5:00 PM, unless otherwise specified or approved by the City.

13.3.2 After-Hours Work

Work outside normal hours, on weekends, or holidays requires prior written approval from the City. Contractor shall notify affected neighbors and coordinate with City police if required.

13.3.3 Noise Restrictions

Contractor shall comply with all local noise ordinances and minimize disturbance to neighboring properties and City operations.

13.4 Parking and Staging

13.4.1 Construction Parking

Contractor shall provide adequate parking for all personnel, equipment, and vehicles. Parking on City streets or neighboring properties requires prior approval.

13.4.2 Staging Areas

Contractor shall confine operations to areas designated for storage and staging. Materials shall be stored in orderly fashion and shall not obstruct access or traffic.

13.4.3 Traffic Control

Contractor shall maintain traffic flow and pedestrian access as required. Traffic control plans require City approval before implementation.

13.5 Site Conditions and Cleanliness

13.5.1 Daily Cleanup

Contractor shall maintain the site in clean, safe condition at all times. Debris and waste shall be removed from the site regularly and disposed of properly.

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All debris must be maintained within site perimeter. Any debris, soil, etc., leaving the site must be cleaned immediately.

13.5.2 Final Cleanup

Before requesting Substantial Completion, Contractor shall:

(a) Remove all debris, rubbish, and waste materials;

(b) Clean all surfaces including windows, fixtures, and equipment;

(c) Remove stains, marks, and dirt from all finished surfaces;

(d) Vacuum and clean all interior spaces;

(e) Leave the site in "broom clean" condition.

13.6 Protection of Existing Facilities

Contractor shall protect existing structures, utilities, vegetation, and improvements from damage. Any damage shall be repaired or replaced at Contractor's expense to the City's satisfaction.

13.7 Utility Coordination

13.7.1 NC 811 Requirements

Before commencing any excavation, Contractor shall:

(a) Contact NC 811 at least three (3) business days in advance;

(b) Mark proposed excavation areas with white paint;

(c) Maintain locate marks throughout construction;

(d) Re-notify if work extends beyond original locate dates.

13.7.2 Utility Protection

Contractor shall:

(a) Protect all existing utilities from damage;

(b) Support and maintain utilities during construction;

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(c) Coordinate shutdowns with City and affected utility companies;

(d) Provide temporary utilities as needed;

(e) Immediately report any utility damage to City and utility owner.

13.7.3 Utility Damage

Contractor shall be responsible for all costs associated with repair of damaged utilities, including emergency repairs, service interruptions, and claims by third parties.

13.8 Public Convenience and Safety

Contractor shall conduct operations to minimize inconvenience to the public and shall:

(a) Maintain access to occupied buildings;

(b) Provide temporary walkways and barriers;

(c) Coordinate deliveries to minimize traffic impact;

(d) Provide flaggers for traffic control as needed;

(e) Maintain emergency vehicle access at all times.

ARTICLE 14: QUALITY CONTROL AND TESTING

14.1 Quality Control Program

Contractor shall establish and maintain a quality control program to ensure all work complies with Contract Documents. The program shall include:

(a) Inspection procedures;

(b) Testing protocols;

(c) Documentation requirements;

(d) Corrective action procedures.

14.2 Testing and Inspections

14.2.1 Required Testing

Contractor shall perform all testing required by the Contract Documents, building codes, and regulatory agencies, including but not limited to:

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(a) Concrete cylinder tests;

(b) Soil compaction tests;

(c) Structural steel inspections;

(d) Mechanical system testing and balancing;

(e) Electrical system testing;

(f) Fire alarm and sprinkler testing;

(g) Any other tests specified.

14.2.2 Testing Costs

All testing required by Contract Documents shall be at Contractor's expense. Retesting due to failures shall be at Contractor's expense.

14.2.3 Independent Testing Agencies

Testing shall be performed by independent testing agencies approved by the City. Contractor shall coordinate testing schedules and provide access.

14.2.4 Test Reports

Contractor shall submit copies of all test reports to the City within five (5) days of receipt. Failed tests shall be reported immediately.

14.3 Material Certifications

Contractor shall provide manufacturer's certifications for materials as required by specifications, including:

(a) Mill certifications for structural steel;

(b) Manufacturer's data sheets;

(c) Fire ratings and listings;

(d) Energy efficiency ratings;

(e) Warranty documentation.

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14.4 City Inspections

The City and its representatives shall have access to the work at all times for inspection. Contractor shall provide safe access and shall not cover any work required to be inspected until inspected and approved.

14.5 Defective Work

14.5.1 Correction of Defects

Work that does not conform to Contract Documents shall be considered defective. The City may require removal and replacement of defective work at Contractor's expense.

14.5.2 Rejection of Defective Work

The City may reject defective work and require: (a) Removal and replacement at Contractor's expense; (b) Repair to City's satisfaction; (c) Acceptance with adjustment in Contract Sum.

14.5.3 Uncovering of Work

If the City requests inspection of work already covered, Contractor shall uncover such work and properly restore it. If work is found to be defective, costs shall be borne by Contractor. If work is found to be acceptable, the City shall pay for uncovering and restoration by Change Order.

ARTICLE 15: WARRANTIES AND GUARANTEES

15.1 General Warranty

Contractor warrants that all work shall be:

(a) Free from defects in materials and workmanship;

(b) In accordance with Contract Documents;

(c) Performed in a good and workmanlike manner;

(d) In compliance with all applicable codes and regulations.

15.1.1 Warranty Exclusions

Contractor’s warranty does not apply to defects or damage caused by abuse, misuse, improper operation, failure to perform routine maintenance, normal wear and tear, vandalism, acts of God, or work performed by others after Substantial Completion. This exclusion does not apply to defects resulting from Contractor’s defective Work, improper installation, or failure to comply with the Contract Documents.

15.2 One-Year Warranty Period

Contractor shall correct any defects in materials or workmanship appearing within one (1) year from the date of Substantial Completion at no cost to the City. This warranty is in addition to any manufacturer warranties required under the Contract Documents.

15.2.1

For punch list items, deferred work, or any Work completed after Substantial Completion, the warranty period for that specific Work shall begin on the date the Work is completed and accepted by the City.

15.3 Extended Warranties

Certain systems and components require extended warranties as specified in Contract Documents, including:

(a) Roofing systems (typically 10-20 years);

(b) HVAC equipment (typically 5-10 years);

(c) Other specialized systems as specified.

15.4 Warranty Claims

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The City shall notify Contractor in writing of observed defects during the warranty period. Contractor shall respond within two (2) business days with a proposed plan and schedule for corrective action, shall commence corrective Work within seven (7) calendar days, and shall complete corrective Work within the timeframe directed by the City.
For defects that create a safety hazard, risk of property damage, or interruption of essential services, Contractor shall respond within twenty four (24) hours and commence corrective Work immediately.
15.4.1
City right to correct to state: "If Contractor fails to respond or correct defective Work within the time required, the City may, after written notice, perform or cause the corrective Work to be performed. Contractor shall reimburse the City for all reasonable costs incurred, including labor, materials, and administrative costs. The City may deduct such costs from retainage, amounts otherwise due to Contractor, or recover such costs through the performance bond.

15.5 Manufacturer's Warranties

Contractor shall obtain and deliver to the City all manufacturer warranties covering equipment, materials, and systems. Manufacturer warranties shall be issued in the City's name and shall commence on the later of Substantial Completion, start up, or acceptance of the applicable system or equipment, unless the Contract Documents require a different commencement date.

15.6 Warranty Extension

If work is corrected during the warranty period, the warranty for that portion of work shall be extended for one (1) year from the date of correction.

15.7 Warranty Bond (If Required)

If specified, Contractor shall provide a warranty bond guaranteeing obligations under the warranty provisions.

15.8 Warranty documentation

Within fourteen (14) days of Substantial Completion, Contractor shall provide a warranty matrix identifying each warranted item, warranty duration, start date, manufacturer, installer, point of contact, and any required maintenance actions. Contractor shall designate a single warranty point of contact responsible for coordinating warranty requests.

ARTICLE 16: PROJECT CLOSEOUT

16.1 Substantial Completion Procedures

16.1.1 Request for Substantial Completion

When Contractor considers the work substantially complete, Contractor shall submit written request for substantial completion inspection including:
(a) Statement that work is substantially complete;
(b) List of minor items remaining to be completed (preliminary punch list);
(c) Expected completion dates for punch list items;
(d) Copies of required certifications and approvals.

16.1.2 Substantial Completion Inspection

Within ten (10) days of request, the City shall conduct inspection to determine if work is substantially complete. The City shall prepare a punch list of items requiring completion or correction.

16.1.3 Certificate of Substantial Completion

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The Certificate of Substantial Completion shall establish the date governing commencement of warranty periods under Article 15, except for Work completed after Substantial Completion as described therein.

(a) Date of Substantial Completion;

(b) Responsibilities of City and Contractor for security, maintenance, utilities;

(c) Time for completing punch list items;

(d) Commencement of warranty period.

16.2 Punch List Completion

Contractor shall complete all punch list items within thirty (30) days of Substantial Completion or within time specified in Certificate of Substantial Completion. The City may withhold final payment until all punch list items are completed.

16.3 Final Completion Requirements

Before final payment, Contractor shall submit:

16.3.1 As-Built Drawings

(a) Complete set of as-built (record) drawings showing:

- All changes made during construction;
- Exact locations of underground utilities and piping;
- Actual dimensions and elevations;
- Equipment locations and model numbers;

(b) Drawings shall be in both hard copy and electronic formats (CAD and PDF);

(c) Drawings shall be clearly marked "AS-BUILT" or "RECORD DRAWINGS."

16.3.2 Operations and Maintenance Manuals

Complete O&M manuals including:

(a) Table of contents organized by specification section;

(b) Operating instructions for all equipment and systems;

(c) Maintenance procedures and schedules;

(d) Parts lists and supplier contact information;

(e) A detailed listing of all subcontractors retained under each specification section, including their respective contact information and the length of warranty coverage for work performed, with warranty periods beginning on the date of Substantial Completion;

(f) Warranty information;

(g) Emergency procedures;

(h) Shop drawings and product data;

(i) Test reports and certifications.

Manuals shall be:

(a) Organized in three-ring binders with tabs;

(b) Submitted in both hard copy (3 sets) and electronic formats;

(c) Written in clear, concise language.

16.3.3 Training

Contractor shall provide training for City personnel on operation and maintenance of all systems and equipment. Training shall include:

(a) Minimum four (4) hours of hands-on training. Depending on the facility type, additional training may be required;

(b) Training during normal business hours;

(c) Training for designated City personnel;

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(d) Documentation of training provided.

16.4 Keys and Access Devices

Contractor shall deliver to the City:
(a) All keys for locks, including master keys;
(b) Access cards, fobs, and codes;
(c) Key schedule showing door numbers and key types;
(d) Spare keys as specified.

16.5 Spare Parts and Materials

Contractor shall deliver spare parts, maintenance materials, and extra stock as specified, including:
(a) Attic stock for ceiling tiles, flooring, etc.;
(b) Spare filters for mechanical systems;
(c) Spare lamps and ballasts;
(d) Touch-up paint;
(e) Other items as specified.

16.6 Cleanup and Removal

Before final inspection, Contractor shall:

(a) Remove all equipment, tools, and surplus materials;

(b) Remove temporary facilities and utilities;

(c) Repair damage caused by removal operations;

(d) Perform final cleaning per Section 13.5.2;

(e) Remove all construction signage.

16.7 Final Inspection and Acceptance

16.7.1 Request for Final Inspection

After completing all punch list items and submitting closeout documentation, Contractor shall request final inspection in writing.

16.7.2 Final Inspection

The City shall conduct final inspection within ten (10) days of request. If work is acceptable, the City shall issue notice of Final Completion.

16.7.3 Acceptance of Work

The City's acceptance of final payment application and payment of final payment amount shall constitute acceptance of the work, subject to warranty obligations.

ARTICLE 17: FEDERAL REQUIREMENTS (If Applicable)

NOTE: The requirements in this Article apply only if this Contract is funded in whole or in part with federal funds. If this is not a federally funded project, this Article does not apply.

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17.1 Davis-Bacon Act Prevailing Wage Requirements

17.1.1 Applicability

If this Contract is funded with federal funds exceeding $2,000, Contractor and all subcontractors shall comply with the Davis-Bacon Act (40 U.S.C. § 3141 et seq.) and pay prevailing wages as determined by the U.S. Department of Labor.

17.1.2 Wage Rate Requirements

(a) All laborers and mechanics employed under this Contract shall be paid wages at rates not less than those established in the wage determination included in the Contract Documents;

(b) Wage rates include basic hourly rates and fringe benefits;

(c) Contractor shall pay at least weekly;

(d) Wage determinations are subject to modification; Contractor shall comply with updated wage determinations issued during the Contract period.

17.1.3 Posting Requirements

Contractor shall post the applicable wage determination at the work site in a prominent and accessible place where it can be easily seen by workers.

17.1.4 Payroll Records and Reporting

Contractor and all subcontractors shall:

(a) Submit weekly certified payrolls to the City on U.S. Department of Labor Form WH-347 or equivalent;

(b) Maintain payroll records for three (3) years after project completion;

(c) Include in each weekly payroll: - Employee names and Social Security numbers; - Labor classifications; - Hours worked per day and week; - Rates paid; - Deductions; - Actual wages paid; - Statement of Compliance signed by authorized representative;

(d) Make records available for inspection by authorized representatives.

17.1.5 Apprentices and Trainees

Apprentices and trainees may be paid less than prevailing wages only if:
(a) They are registered in bona fide apprenticeship programs approved by U.S. Department of Labor;

(b) Ratio of apprentices to journeymen complies with program requirements;

(c) Proper documentation is submitted.

17.1.6 Penalties for Non-Compliance

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Failure to comply with Davis-Bacon requirements may result in:

(a) Withholding of payments;

(b) Termination of Contract;

(c) Liability for back wages owed to workers;

(d) Debarment from future federal contracts.

17.2 Contract Work Hours and Safety Standards Act

If Contract exceeds $100,000, the Contract Work Hours and Safety Standards Act (40 U.S.C. § 3701 et seq.) applies:

(a) No laborer or mechanic shall be required or permitted to work more than forty (40) hours in any workweek unless paid overtime at rate of one and one-half times basic rate for hours over forty;

(b) Contractor shall compute overtime on a weekly basis;

(c) Violation may result in liability for unpaid overtime wages and liquidated damages of $33 per worker per calendar day of violation (29 CFR § 5.8(a), effective rate per current DOL schedule).

17.3: Federal Nondiscrimination And Civil Rights Requirements

17.3.1 General Federal Civil Rights Compliance

During performance of this Contract, and to the extent this Contract is funded in whole or in part with federal funds, Contractor agrees to comply with all applicable federal civil rights laws and regulations, including but not limited to:

(a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq.)

- Prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving federal financial assistance.
- Contractor shall comply with implementing regulations of the applicable federal funding agency.**(b) Section 504 of the Rehabilitation Act of 1973** (29 U.S.C. § 794)
- Prohibits discrimination on the basis of disability in programs and activities receiving federal financial assistance.

(c) Age Discrimination Act of 1975 (42 U.S.C. § 6101 et seq.)

- Prohibits discrimination on the basis of age in programs and activities receiving federal financial assistance.

(d) Title II of the Americans with Disabilities Act of 1990 (42 U.S.C. § 12131 et seq.)

- Prohibits discrimination on the basis of disability by public entities (applicable when City is recipient).

(e) Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et seq.)

- Prohibits discrimination on the basis of sex in education programs and activities receiving federal financial assistance (if applicable).

17.3.2 Federal Agency-Specific Requirements

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Contractor shall comply with civil rights requirements specific to the federal funding source, including:

(a) U.S. Department of Transportation (USDOT) Projects:

- 49 C.F.R. Part 21 (Nondiscrimination in Federally-Assisted Programs)
- 49 C.F.R. Part 26 (DBE Program - covered in Article 7)
- 23 C.F.R. Part 230 (External Programs) if FHWA-funded
- 23 C.F.R. § 635.117 (Nondiscrimination in Federal-aid construction contracts)

(b) U.S. Department of Housing and Urban Development (HUD) Projects:

- 24 C.F.R. Part 1 (Nondiscrimination in Federally Assisted Programs)
- Fair Housing Act (42 U.S.C. § 3601 et seq.)
- Section 3 (12 U.S.C. § 1701u - covered in Article 17.6)

(c) U.S. Environmental Protection Agency (EPA) Projects:

- 40 C.F.R. Parts 7 and 15 (Nondiscrimination requirements)

(d) Other Federal Agencies:

- Contractor shall comply with Title VI implementing regulations of any other federal agency providing funding for this project.

17.3.3 Equal Employment Opportunity in Federal Contracting

If this Contract meets the thresholds established in Executive Order 11246, as amended, Contractor agrees to comply with:

(a) Executive Order 11246 (Equal Employment Opportunity)

(b) 41 C.F.R. Chapter 60 (Office of Federal Contract Compliance Programs regulations), including:

- 41 C.F.R. Part 60-1 (Obligations of Contractors and Subcontractors)
- 41 C.F.R. Part 60-2 (Affirmative Action Programs)
- 41 C.F.R. Part 60-4 (Construction Contractors - Affirmative Action Requirements)
- 41 C.F.R. Part 60-741 (Veterans)
- 41 C.F.R. Part 60-300 (Disabled Workers)

Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, national origin, disability, or status as a protected veteran. Contractor shall take affirmative action to ensure that applicants are employed and employees are treated during employment without regard to these characteristics.

17.3.4 Nondiscrimination Assurances

By executing this Contract, Contractor provides assurance that:

(a) No person shall, on the grounds of race, color, national origin, sex, age, or disability, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity conducted or receiving federal financial assistance.

(b) Contractor will comply with all federal nondiscrimination statutes and regulations in effect or adopted during the term of this Contract.

(c) In the event Contractor distributes federal assistance to another recipient, Contractor will include these nondiscrimination assurances in all agreements with subrecipients.

17.3.5 Required Posting

Contractor shall post in conspicuous places available to employees and applicants for employment notices setting forth the provisions of applicable nondiscrimination requirements.

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17.3.6 Flow-Down Requirements

Contractor shall include the requirements of this Article 17.3 in every subcontract and purchase order, so that such provisions will be binding upon each subcontractor and supplier.

17.3.7 Compliance Verification and Records

Contractor shall:

(a) Permit access to books, records, accounts, and work sites for purposes of investigation to ascertain compliance with nondiscrimination requirements;

(b) Maintain records demonstrating nondiscrimination compliance for three (3) years following project completion;

(c) Submit reports and certifications as required by the City or applicable federal funding agency.

17.3.8 Remedies for Noncompliance

Failure to comply with federal nondiscrimination requirements may result in:

(a) Withholding of payments; (b) Termination of Contract; (c) Suspension or debarment from future federal or federally-assisted contracts; (d) Such other remedies as provided by federal law and regulations.

17.4 Copeland "Anti-Kickback" Act

Contractor shall comply with the Copeland "Anti-Kickback" Act (40 U.S.C. § 3145), which prohibits:

(a) Inducing any employee to give up any part of compensation to which entitled;

(b) Receiving kickbacks or any other prohibited benefit from employees;

(c) Violation may result in fines, imprisonment, and Contract termination.

17.5 Buy America Provisions

17.5.1 Applicability

If this Contract involves iron, steel, manufactured products, or construction materials and is funded with federal funds under the Airport Improvement Program (AIP) or Infrastructure Investment and Jobs Act (IIJA), Buy American Preference requirements apply under 49 U.S.C. § 50101, the Build America, Buy America Act (BABA) (IIJA §§ 70901-70927), and Executive Order 14005. These requirements flow down to all subcontractors and suppliers.

17.5.2 Requirements

(a) All iron and steel used in the project must be produced in the United States;

(b) "Produced in the United States" means all manufacturing processes, from initial melting through final coating, occurred in the United States;

(c) Manufactured products must be manufactured in the United States and the cost of U.S. components and subcomponents must exceed 60% of the total cost of all components (49 U.S.C. § 50101(b)(3); BABA);

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(d) Construction materials must be manufactured in the United States.

17.5.3 Certification
Contractor shall provide certification of compliance with Buy America requirements and shall obtain certifications from all subcontractors and suppliers.

17.5.4 Waivers
Buy America requirements may be waived if:

(a) Applying requirements would be inconsistent with public interest;

(b) Iron, steel, or manufactured products are not produced in United States in sufficient quantities or quality;

(c) Use of domestic materials will increase project cost by more than 25%.

Waiver requests must be submitted through the City to the federal funding agency.

17.6 Section 3 Requirements (HUD-Funded Projects)

If this Contract is funded with U.S. Department of Housing and Urban Development (HUD) funds exceeding $200,000, Section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. § 1701u) applies:

17.6.1 Section 3 Goals
To the greatest extent feasible, Contractor shall provide:

(a) Training and employment opportunities to low- and very low-income residents (Section 3 workers) of the project area;

(b) Contracting and subcontracting opportunities to Section 3 business concerns.

17.6.2 Section 3 Benchmarks
Contractor shall meet the following benchmarks or demonstrate qualitative efforts:

(a) 25% of total labor hours for Section 3 workers;

(b) 5% of total labor hours for targeted Section 3 workers (public housing residents or YouthBuild participants);

(c) 5% of total contracting dollars to Section 3 business concerns.

17.6.3 Section 3 Reporting
Contractor shall maintain records and submit reports documenting compliance with Section 3 requirements.

17.7 Energy Efficiency Standards

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If this Contract involves construction or renovation of residential or commercial buildings and is funded with certain federal funds (such as Community Development Block Grants), projects must meet applicable energy efficiency standards, including but not limited to Energy Star certification requirements.

17.8 Environmental Requirements

17.8.1 National Environmental Policy Act (NEPA)

If required by the federal funding agency, Contractor shall comply with NEPA requirements and any environmental mitigation measures identified in environmental reviews.

17.8.2 Historic Preservation

If the project affects properties listed or eligible for listing on the National Register of Historic Places, Contractor shall comply with Section 106 of the National Historic Preservation Act and follow any agreed-upon mitigation measures.

17.9 Debarment and Suspension

Contractor certifies that neither Contractor nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in transactions by any federal department or agency.

17.10 Lobbying Restrictions

If this Contract exceeds $100,000, Contractor certifies that:

(a) No federal appropriated funds have been or will be paid to any person for influencing or attempting to influence federal officials regarding this Contract;

(b) If any non-federal funds have been or will be paid for such purposes, Contractor shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying."

17.11 Federal Funding Acknowledgment

Contractor acknowledges that this Contract is funded in whole or in part with federal funds and that federal requirements take precedence over state and local requirements to the extent of any conflict. Contractor shall include applicable federal requirements in all subcontracts.

17.12 Monitoring and Compliance

The City, federal funding agencies, the Comptroller General, and their authorized representatives shall have access to all Contractor records related to this Contract for purposes of monitoring compliance with federal requirements.

17.13 Access to Records and Reports — MANDATORY (2 CFR §§ 200.334, 200.337; FAA Order 5100.38) — All AIP Contracts

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Aviation Administration, and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents,

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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. This requirement flows down to all subcontracts and sub-tier agreements.

17.14 Breach of Contract Terms (2 CFR Part 200, Appendix II(A)) — Contracts > $350,000

Any violation or breach of terms of this contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement. Owner will provide Contractor written notice that describes the nature of the breach and corrective actions the Contractor must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner's notice will identify a specific date by which the Contractor must correct the breach. Owner may proceed with termination of the contract if the Contractor fails to correct the breach by the deadline indicated in the Owner's notice. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights, and remedies otherwise imposed or available by law.

17.15 Clean Air and Water Pollution Control — FAA Reporting Supplement (2 CFR Part 200, App. II(G)) — Contracts > $150,000

In addition to the environmental compliance requirements of Article 18, Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. §§ 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration. Contractor must include this requirement in all subcontracts that exceed $150,000.

17.16 Distracted Driving (EO 13513) — Contracts > $15,000

The Contractor is encouraged to adopt and enforce workplace policies that ban text messaging while driving a Government vehicle, or while driving a privately owned vehicle when on official Government business or when performing any work for or on behalf of the Federal Government. Employees and contractors are encouraged to conduct safety awareness programs and implement other appropriate measures to decrease accidents caused by distracted driving. This requirement flows down to all subcontractors.

17.17 Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (2 CFR § 200.216; P.L. 115-232 § 889) — All AIP Contracts

The Contractor and subcontractors may not obligate or expend federal loan or grant funds to: (1) procure or obtain equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system or as critical technology; (2) enter into a contract to procure or obtain such equipment or services; or (3) provide, as part of its

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performance of this award, equipment or systems that use covered telecommunications equipment or services. "Covered telecommunications" includes equipment or services produced or provided by Huawei Technologies, ZTE Corporation, Hytera Communications, Hangzhou Hikvision Digital Technology, and Dahua Technology, and their subsidiaries and affiliates (2 CFR § 200.216). This requirement flows down to all subcontracts and purchase orders.

17.18 Drug-Free Workplace Requirements (41 U.S.C. §§ 8101-8106) — All AIP Contracts

As required by the Drug-Free Workplace Act of 1988 (41 U.S.C. §§ 8101-8106), the Contractor certifies that it will maintain a drug-free workplace by: (a) publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the contractor's workplace; (b) establishing a drug-free awareness program; (c) notifying each employee that compliance with the drug-free workplace policy is a condition of employment; (d) notifying the contracting agency within 10 days of any employee convicted of a drug violation in the workplace; and (e) taking appropriate action against convicted employees and making a good-faith effort to maintain a drug-free workplace.

17.19 Federal Fair Labor Standards Act — Federal Minimum Wage (29 U.S.C. § 201 et seq.) — All AIP Contracts

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 youth employment standards. The Contractor and all subcontractors shall comply with all applicable FLSA requirements and shall make files and records pertaining to wages, hours, and conditions of employment available to the Administrator of the Wage and Hour Division upon request.

17.20 Procurement of Recovered Materials (2 CFR § 200.323; 42 U.S.C. § 6962; 40 CFR Part 247) — Contracts > $10,000

In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired: (1) competitively within a timeframe providing for compliance with the contract performance schedule; (2) meeting contract performance requirements; or (3) at a reasonable price. Information about EPA-designated items is available at the EPA Comprehensive Procurement Guidelines website: https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program (40 CFR Part 247). This requirement flows down to all subcontracts exceeding $10,000.

17.21 Seismic Safety (42 U.S.C. § 7701; EO 12699; 49 CFR Part 41) — New Building Construction and Substantial Rehabilitation

Where this contract involves construction of new buildings, additions to existing buildings, or substantial rehabilitation or repair of existing buildings, the Contractor agrees that all such work will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations (49 CFR Part 41) and will certify to compliance to the extent required by the regulation. The Contractor also agrees to ensure that all work performed under this contract, including work performed by a subcontractor, is in

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compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

17.22 Tax Delinquency and Felony Convictions (Consolidated Appropriations Act) — All AIP Contracts

The Contractor certifies that it: (a) 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; and (b) is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months. If the Contractor is unable to make the above certifications, the Contractor must provide a written explanation. This certification is a continuing obligation throughout the term of the contract.

17.23 Trade Restriction Certification (49 U.S.C. § 50104; 49 CFR Part 30) — All AIP Contracts

By execution of this contract, the Contractor certifies that with respect to this contract: (a) it is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR); (b) it has not knowingly entered into any 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; and (c) it 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. Contractor shall obtain corresponding certifications from all subcontractors. Unless the restrictions of this clause are waived by the Secretary of Transportation per 49 CFR 30.17, no contract shall be awarded to a party that cannot make this certification.

17.24 Veteran's Preference (49 U.S.C. § 47112(c)) — All AIP Contracts

In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to veterans of the Vietnam era and disabled veterans as defined in 49 U.S.C. § 47112. However, this preference may be given only where the individuals are available and qualified to perform the work to which the employment relates. This requirement flows down to all subcontracts.

17.25 Domestic Preferences for Procurements (41 U.S.C. § 8302; EO 14005; IIJA §§ 70901-70927) — All AIP Contracts

As appropriate and to the greatest extent practicable under this Federal award, the Contractor shall provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States, including but not limited to iron, aluminum, steel, cement, and other manufactured products. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products; aggregates such as concrete; glass, including optical fiber; and lumber. This requirement

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must be included in all subcontracts and purchase orders for work or products under this contract.

17.26 Prohibition of Covered Unmanned Aircraft Systems (UAS) (P.L. 118-63 § 611; 10 U.S.C. § 4661 note) — All AIP Contracts

Federal funds under this contract may not be used to purchase or use a covered unmanned aircraft system, as defined in Section 611 of the FAA Reauthorization Act of 2024 (P.L. 118-63) and 10 U.S.C. § 4661 note. A "covered unmanned aircraft system" means any unmanned aircraft system manufactured or assembled by a covered foreign entity as listed under that statute. The Contractor shall include this prohibition in all subcontracts and lower-tier agreements funded under this contract.

17.27 FAA Subcontractor Flow-Down Obligations (FAA Contract Provision Guidelines, March 17, 2026; 2 CFR Part 200; 49 CFR Part 26) — All AIP Contracts

17.27.1 Prime Contractor Responsibility. The prime Contractor is solely and fully responsible for compliance with all FAA federal contract provisions set forth in this Article 17 by any subcontractor, lower-tier subcontractor, or service provider at any tier. This responsibility is non-delegable. The prime Contractor's obligation to ensure compliance is not diminished by the failure of any subcontractor or sub-tier participant to comply, and the prime Contractor shall bear all consequences of such non-compliance as if the violation were the prime Contractor's own.

17.27.2 Mandatory Insertion into Subcontracts. The Contractor shall insert the applicable FAA federal contract provisions of this Article 17 into every subcontract and sub-tier subcontract agreement at every tier, regardless of the dollar amount of the subcontract, except where a specific provision states a minimum dollar threshold. Provisions with mandatory text (as identified in each section heading) must be inserted verbatim without modification. Provisions without mandatory text must be inserted in language that fully meets the intent and purpose of the applicable federal law or regulation. The Contractor shall also require each subcontractor to insert the applicable provisions into any lower-tier subcontracts and sub-agreements, creating an unbroken chain of obligation from the prime Contractor through every tier to the work being performed with federal funds.

17.27.3 Incorporation by Reference for Purchase Orders and Supply Agreements. For work performed under purchase orders, rental agreements, and other agreements for supplies or services where insertion of the full text of each provision is impractical, the Contractor shall require that the applicable FAA federal contract provisions be incorporated by reference. Such incorporation by reference shall cite this Contract, identify Article 17 by name and article number, and state that the subcontractor or supplier is bound by all applicable provisions therein to the same extent as the prime Contractor. Incorporation by reference does not relieve the prime Contractor of its obligation under Section 17.27.1 to ensure actual compliance at every tier.

17.27.4 Specific Provisions Requiring Verbatim Flow-Down. The following provisions contain mandatory text that must be inserted verbatim and without modification into all applicable subcontracts and sub-tier agreements: (a) General Civil Rights Provisions (Art. 8.A) — all subcontracts at every tier, regardless of dollar amount; (b) Title VI Nondiscrimination Requirements (Art. 8.B) — all subcontracts at every tier; (c) DBE Mandatory Assurance (Art.

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7.8.1) — all subcontracts at every tier per 49 CFR § 26.13; (d) Contract Workhours and Safety Standards Act (Art. 17.2) — subcontracts exceeding $100,000; (e) Davis-Bacon Requirements (Art. 17.1) — construction subcontracts exceeding $2,000 per 29 CFR §§ 5.5(a)(1) through (10); (f) DBE Prompt Payment (Art. 7.9) — all subcontracts per 49 CFR § 26.29.

17.27.5 Subcontract Review and Verification. The City reserves the right to review any subcontract or sub-tier agreement to verify that applicable FAA federal contract provisions have been properly included. Upon written request by the City or the Federal Aviation Administration, the Contractor shall provide complete copies of all subcontracts, purchase orders, and related documents within five (5) business days. The Contractor shall not execute any subcontract that omits required federal provisions, and the execution of a deficient subcontract shall itself constitute a material breach of this Contract.

17.27.6 Debarment Verification for Subcontractors. Before executing any subcontract or sub-tier agreement exceeding $25,000, the Contractor shall verify that the proposed subcontractor is not presently debarred, suspended, or excluded from participation in federally-assisted transactions by checking the System for Award Management at https://www.sam.gov, collecting a debarment certification from the subcontractor, and inserting a debarment and suspension clause in the subcontract as required by Art. 17.9. The prime Contractor shall maintain records of SAM.gov checks and certifications for three (3) years following final project completion and shall make them available to the City or FAA upon request.

17.27.7 Consequences of Subcontractor Non-Compliance. Non-compliance with the FAA federal contract provisions by any subcontractor or sub-tier participant, regardless of tier, shall be treated as non-compliance by the prime Contractor. The City may, in its sole discretion: (a) direct the prime Contractor to take specific corrective action with the non-compliant subcontractor within a time period specified by the City; (b) withhold payments to the prime Contractor until the non-compliance is corrected; (c) require the prime Contractor to terminate the non-compliant subcontractor and replace the firm, subject to DBE substitution requirements where applicable; or (d) treat the non-compliance as a material breach of this Contract subject to the termination provisions of Article 23. The prime Contractor shall not be entitled to additional compensation or time extensions resulting from corrective actions required under this section.

ARTICLE 18: ENVIRONMENTAL COMPLIANCE AND EROSION CONTROL

18.1 Environmental Protection

Contractor shall conduct operations in manner that minimizes environmental impacts and complies with all environmental laws and regulations, including:

(a) Clean Water Act;

(b) Clean Air Act;

(c) Resource Conservation and Recovery Act;

(d) North Carolina environmental regulations;

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(e) Local environmental ordinances.

18.2 Erosion and Sediment Control

18.2.1 Erosion Control Plan

If project disturbs one acre or more, Contractor shall:

(a) Obtain coverage under North Carolina's NPDES General Permit (NCG01) for stormwater discharges;

(b) Prepare and implement an Erosion and Sediment Control Plan in accordance with NC Sedimentation Pollution Control Act (N.C. Gen. Stat. § 113A-50 et seq.);

(c) Install and maintain erosion control measures including silt fencing, sediment basins, inlet protection, and temporary stabilization;

(d) Conduct inspections at least every seven (7) days and within 24 hours of storm events;

(e) Maintain records and make available for inspection.

18.2.2 Stormwater Pollution Prevention

Contractor shall implement best management practices to prevent pollution of stormwater, including:

(a) Proper storage and handling of materials;

(b) Containment of concrete washout;

(c) Control of dust and airborne particulates;

(d) Prevention of tracking sediment onto public streets;

(e) Protection of storm drain inlets.

18.3 Hazardous Materials Management

18.3.1 Hazardous Materials Handling

Contractor shall:

(a) Store all hazardous materials in approved containers;

(b) Maintain Safety Data Sheets (SDS) on site;

(c) Implement spill prevention measures;

(d) Have spill response equipment readily available;

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(e) Immediately report spills to City and appropriate agencies.

18.3.2 Waste Disposal
All waste materials shall be disposed of properly:

(a) Solid waste to licensed landfills;

(b) Hazardous waste through licensed hazardous waste haulers;

(c) Recyclable materials to recycling facilities where feasible;
(d) No burning of waste materials on site unless specifically approved.

18.3.3 Asbestos and Lead Paint
If work involves structures built before 1978 or that may contain asbestos:

(a) Contractor shall comply with OSHA asbestos standards (29 C.F.R. § 1926.1101);

(b) Contractor shall comply with EPA Lead Renovation, Repair and Painting Rule (40 C.F.R. Part 745);

(c) Contractor shall employ certified lead and asbestos professionals as required;

(d) Contractor shall implement appropriate containment and disposal procedures.

18.4 Wetlands and Protected Areas

Contractor shall not disturb wetlands, streams, or other protected environmental areas without proper permits from U.S. Army Corps of Engineers, NC Department of Environmental Quality, and other agencies having jurisdiction.

18.5 Tree Protection

Contractor shall protect trees designated for preservation:

(a) Install tree protection fencing at drip line;

(b) Prohibit storage, traffic, or construction activities within protected areas;

(c) Contractor shall be liable for damage to protected trees at rate specified in Contract Documents or $1,000 per caliper inch, whichever is greater.

ARTICLE 19: SAFETY REQUIREMENTS

19.1 Safety Program

Contractor shall establish and maintain a comprehensive safety program complying with:

(a) Occupational Safety and Health Act (OSHA) regulations (29 C.F.R. Part 1926);

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(b) North Carolina Department of Labor safety requirements;

(c) Industry safety standards;

(d) Contract-specific safety requirements.

19.2 Site Safety Plan

Within ten (10) days of Notice to Proceed, Contractor shall submit a Site Safety Plan including:

(a) Identification of site-specific hazards;

(b) Safety procedures and protocols;

(c) Emergency response procedures;

(d) Competent person designations;

(e) Training requirements;

(f) Personal protective equipment (PPE) requirements.

19.3 Safety Meetings and Training

Contractor shall:
(a) Conduct daily toolbox safety talks; (b) Hold weekly safety meetings; (c) Provide OSHA 10-hour or 30-hour training for workers as appropriate; (d) Train workers on hazard communication (HazCom); (e) Maintain training records.

19.4 Accident Reporting

Contractor shall immediately report to the City:

(a) All fatalities and serious injuries;

(b) Incidents requiring medical treatment beyond first aid;

(c) Near-miss incidents;

(d) Property damage incidents exceeding $1,000;

(e) Spills or environmental releases.
Contractor shall submit written accident reports within 24 hours using forms provided by the City.

19.5 OSHA Compliance

19.5.1 General Requirements

Contractor shall comply with all applicable OSHA standards, including but not limited to:
(a) Fall protection (29 C.F.R. § 1926.501);

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(b) Scaffolding (29 C.F.R. § 1926.451);

(c) Excavation and trenching (29 C.F.R. § 1926.651);

(d) Electrical safety (29 C.F.R. § 1926.400);

(e) Personal protective equipment (29 C.F.R. § 1926.95);

(f) Hazard communication (29 C.F.R. § 1926.59).

19.5.2 Competent Persons
Contractor shall designate competent persons as required by OSHA for:
(a) Excavation and trenching operations; (b) Scaffolding erection and inspection; (c) Fall protection systems; (d) Other operations requiring competent person oversight.

19.6 Right to Stop Work

The City reserves the right to stop work if Contractor's operations create imminent danger or serious safety violations. Contractor shall bear all costs associated with work stoppage due to safety violations.

ARTICLE 20: DISPUTES, CLAIMS, AND REMEDIES

20.1 Claims Procedure

20.1.1 Notice of Claim
Any claim by Contractor for adjustment of Contract Sum or Contract Time must be submitted in writing to the City within ten (10) calendar days after occurrence of the event giving rise to the claim or within ten (10) days after Contractor knew or should have known of the facts giving rise to the claim.

20.1.2 Claim Documentation
Each claim shall include:
(a) Detailed factual statement of claim; (b) Specific Contract provisions supporting claim; (c) Supporting documentation including schedules, cost records, correspondence; (d) Amount claimed (if monetary); (e) Time extension requested (if applicable); (f) Relief requested.

20.1.3 City Review
The City shall review claims and respond in writing within thirty (30) days. The City's decision shall be final and binding unless Contractor pursues further remedies as provided herein.

20.2 Continuing Performance During Disputes

Contractor shall continue to perform work diligently during pendency of any dispute or claim. Failure to continue performance may constitute material breach and grounds for termination.

20.3 Mediation

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If the parties cannot resolve a dispute through negotiation, either party may request non-binding mediation. The parties shall share mediation costs equally. Mediation shall be conducted in Cumberland County, North Carolina.

20.4 Litigation

If mediation is unsuccessful or either party declines mediation, disputes may be resolved through litigation in accordance with Article 25 (Governing Law and Venue).

20.5 No Waiver of Sovereign Immunity

Nothing in this Contract shall be construed as a waiver of the City's governmental immunity under North Carolina law.

20.6 Attorney's Fees

If either party brings legal action to enforce this Contract, the prevailing party shall be entitled to recover reasonable attorney's fees and costs.

ARTICLE 21: SUSPENSION OF WORK

21.1 City's Right to Suspend

The City may, at any time and for any reason, suspend all or any portion of the work by giving written notice to Contractor. Upon receipt of notice, Contractor shall:

(a) Immediately suspend work as directed;

(b) Protect and secure work in place;

(c) Provide security as necessary;

(d) Take reasonable measures to minimize costs.

21.2 Compensation for Suspension

If suspension exceeds thirty (30) consecutive days and is not due to Contractor's fault, Contractor may be entitled to adjustment for:
(a) Actual costs of demobilization and remobilization; (b) Actual costs of protecting and securing work; (c) Actual extended general conditions costs; (d) Extension of Contract Time.
Contractor shall not be entitled to anticipated profit on work not performed during suspension.

21.3 Resumption of Work

The City shall provide written notice to resume work. Contractor shall resume work within seven (7) days of notice unless a different time is specified.

ARTICLE 22: CITY PAYMENT OBLIGATIONS

City does hereby covenant and agree with Contractor that it will pay to Contractor, when due payable under the terms of said Specifications and said Award, the above mentioned sum, and that

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it will faithfully comply with and perform each and every obligation imposed upon it by said Specifications and the terms of said Award.

ARTICLE 23: TERMINATION PROVISIONS

23.1 Termination For Convenience Of The City

23.1.1 City's Right to Terminate

The City may terminate this Contract, in whole or in part, for its convenience whenever the City determines that such termination is in the City's best interest. The City shall provide written notice of termination to Contractor specifying the extent of termination and the effective date, which shall be not less than ten (10) calendar days from the date of the notice.

23.1.2 Contractor's Obligations Upon Notice

Upon receipt of a notice of termination, and except as otherwise directed by the City, Contractor shall immediately proceed with the following obligations:

(a) **Stop Work.** Stop work as specified in the notice on the date and to the extent specified;

(b) **Terminate Orders.** Terminate all subcontracts and orders to the extent they relate to the terminated work;

(c) **Protect Property.** Take all necessary or directed action to protect and preserve property in Contractor's possession in which the City has or may acquire an interest;

(d) **Transfer Title.** Transfer title and deliver to the City, in the manner and to the extent directed:

- Completed supplies and work in process;
- Parts, materials, tools, dies, jigs, fixtures, plans, drawings, information, and contract rights (collectively "Materials") acquired or produced for the terminated work, whether completed or in process;

(e) **Settlement of Obligations.** Use best efforts to sell, as directed or authorized by the City, any property of the types referred to in subsection (d) above. However, Contractor:

- Shall not be required to extend credit to any purchaser; and
- May acquire the property under the conditions prescribed by and at prices approved by the City;

(f) **Complete Performance.** Complete performance of work not terminated;

(g) **Take Protective Action.** Take any action that may be necessary, or that the City may direct, for the protection and preservation of property related to this Contract that is in Contractor's possession and in which the City has or may acquire an interest;

(h) **Promptly Submit Claims.** Submit to the City, within sixty (60) calendar days from the effective date of termination, or such longer period as approved by the City, a properly supported termination settlement proposal.

23.1.3 Basis for Settlement

After receipt of a notice of termination, Contractor shall submit to the City its termination claim, in the form and with the certification prescribed by the City. Such claim shall be submitted promptly but in no event later than sixty (60) calendar days from the effective date of termination, unless one or more extensions in writing are granted by the City upon written request of Contractor made within such sixty (60) day period or authorized extension thereof.

Upon termination for convenience, Contractor shall be entitled to receive payment for:

(a) **Completed Work.** All work executed in accordance with the Contract Documents and

accepted by the City prior to the effective date of termination;
(b) **Work in Progress.** Work in progress to the extent it represents a portion of the Contract Sum that has value to the City, subject to the City's verification and acceptance;
(c) **Materials and Equipment.** Materials, equipment, and supplies purchased or irrevocably committed for purchase by Contractor for use in the work, provided that:

- Such materials conform to Contract requirements;
- Title to materials shall pass to the City upon payment;
- Materials shall be delivered to the City or stored and protected as directed;
- Contractor provides satisfactory evidence of purchase commitments;

(d) **Settlement Costs.** Actual, reasonable costs necessarily incurred by Contractor in preparing to perform and in performing the terminated work, including:

- Costs of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the Contract (excluding the amounts of such settlements);
- Reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data;
- Demobilization costs actually incurred;
- Costs of breaking down and removing temporary facilities and returning the site to the condition required by the Contract Documents;
- Costs of storing and protecting materials, equipment, and property in Contractor's possession;

(e) **Reasonable Profit.** A reasonable profit on the cost of work performed, but excluding:

- Profit on settlement expenses under subsection (d);
- Profit on materials and equipment that were not incorporated into the work and that are returned to suppliers under arrangements satisfactory to the City;

23.1.4 Excluded Costs
The following costs shall NOT be allowable in the termination settlement:
(a) Anticipated profit on unperformed work;
(b) Costs that would have been incurred regardless of termination (e.g., general overhead not specifically allocable to this Contract);
(c) Claims for damages, including loss of anticipated profits or revenue on work not performed;
(d) Costs not properly allocable to the terminated work;
(e) Costs for which Contractor has been or will be reimbursed under any other Contract or agreement;
(f) Excessive or unreasonable costs as determined by the City.
23.1.5 Total Amount Limitation
In no event shall the total amount paid to Contractor under a termination for convenience exceed the Contract Sum, less payments otherwise made or to be made, and less the contract price of work not terminated.
23.1.6 Termination Settlement Proposal
Contractor's termination settlement proposal shall include:
(a) A detailed itemization of all claims under Section 23.1.3;
(b) Complete supporting documentation, including:

- Copies of paid invoices;
- Certified payroll records;
- Subcontractor termination settlement agreements;

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- Equipment rental records;
- General ledger entries;
- Cost allocation methodologies;

(c) A schedule of values showing percentage of completion for each line item at time of termination;
(d) An inventory of materials and equipment purchased for the work;
(e) A list of all outstanding subcontracts and purchase orders, with termination proposals from each;
(f) Certification by Contractor's authorized representative that:

- The claim is made in good faith;
- Supporting data is accurate and complete;
- The amount claimed is just and proper;
- Contractor is entitled to payment under the terms of the Contract.

23.1.7 City's Right to Audit
The City shall have the right to audit and examine all books, records, and other evidence and supporting documents of Contractor relevant to the termination settlement proposal. Contractor shall preserve all such records for three (3) years after final settlement.
23.1.8 Assignment of Subcontracts
The City may require Contractor to assign to the City all or any part of Contractor's right, title, and interest under any or all subcontracts and purchase orders terminated as a result of the termination of this Contract. Upon such assignment, the City shall have the right, in its discretion, to settle or pay any or all claims arising out of termination of such subcontracts and orders.
23.1.9 Continuing Obligations
Termination of this Contract, either in whole or in part, shall not relieve Contractor of obligations under the Contract for work not terminated, including but not limited to:
(a) Warranty obligations for completed work under Article 15; (b) Indemnification obligations under Article 2.3; (c) Insurance obligations under Article 4 for work performed; (d) Confidentiality obligations, if any; (e) Compliance with federal and state nondiscrimination requirements.
23.1.10 Subcontractor Claims
Before submitting a termination settlement proposal, Contractor shall obtain settlement proposals from all terminated subcontractors. Contractor may include in its own proposal only costs and profits applicable to work performed by Contractor's own forces, plus settlement costs of subcontracts properly chargeable to the terminated work.
23.1.11 Disputes
If Contractor and the City fail to agree upon the amount to be paid as a result of termination for convenience, the City shall pay Contractor the amount determined by the City. Any dispute concerning questions of fact arising under this termination clause shall be resolved in accordance with Article 20 (Disputes, Claims, and Remedies).
23.1.12 Notice to Sureties
The City shall provide notice of termination to any sureties providing payment and performance bonds for the Contract.
23.1.13 Partial Termination
If only part of the work is terminated, Contractor shall file a proposal for an equitable adjustment of the price for the continued portion of the Contract. The City shall make an equitable adjustment for any increase or decrease in the cost of, or time required for, performance of the remainder of the Contract resulting from the partial termination.

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23.1.14 Effect on Other Remedies
The rights and remedies of the City provided in this Article 23.1 are in addition to any other rights and remedies provided by law or under this Contract.

23.2 Termination For Cause (Default).
23.2.1 GROUNDS FOR TERMINATION. The CITY may, subject to the provisions of Section 23.2.2, terminate this Agreement in whole or in part if CONTRACTOR:
(a) Fails to perform the work within the time specified in this Agreement or any written authorization or extension granted by the CITY;
(b) Fails to make progress in the performance of the work so as to endanger performance of this Agreement in accordance with its terms;
(c) Fails to comply with any material term or condition of this Agreement, including but not limited to obligations regarding insurance, indemnification, payment and performance bonds, compliance with laws, or quality of workmanship; or
(d) Anticipatorily repudiates its obligations under this Agreement.
23.2.2 NOTICE AND OPPORTUNITY TO CURE. Before terminating this Agreement for cause, the CITY shall provide written notice to CONTRACTOR specifying:
(a) The nature and details of the default or failure to perform;
(b) The corrective action required; and
(c) The time period within which CONTRACTOR must cure the default.
CONTRACTOR shall have ten (10) calendar days from receipt of such notice to cure the default or, if the default cannot reasonably be cured within ten (10) days, to commence cure and submit a written cure plan acceptable to the CITY demonstrating how CONTRACTOR will diligently pursue cure to completion within a reasonable time period. The CITY, in its sole discretion, may approve an extended cure period not to exceed thirty (30) additional days.
23.2.3 TERMINATION AFTER FAILURE TO CURE. If CONTRACTOR fails to cure the default within the specified time period or fails to diligently pursue an approved cure plan, the CITY may terminate this Agreement, in whole or in part, by providing written notice of termination to CONTRACTOR. The termination shall be effective as specified in the notice, but no earlier than ten (10) calendar days after CONTRACTOR's receipt of the notice of termination.
23.2.4 CONTRACTOR'S OBLIGATIONS UPON TERMINATION FOR CAUSE. Upon receipt of a notice of termination for cause, and except as otherwise directed by the CITY, CONTRACTOR shall:
(a) Immediately stop work under this Agreement on the date and to the extent specified in the notice of termination;
(b) Place no further orders or subcontracts for materials, equipment, supplies, or services related to the terminated work, except as necessary to complete any portion of the work not terminated;
(c) Terminate all orders and subcontracts to the extent they relate to the terminated work;
(d) Transfer title and deliver to the CITY, in the manner and to the extent directed by the CITY:
(1) All fabricated or unfabricated parts, work in process, completed work, supplies, equipment,

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and other materials acquired or produced for the terminated portion of this Agreement; (2) All construction documents, shop drawings, submittals, as-built drawings, operation and maintenance manuals, warranties, and other project documentation; (3) All tools, construction equipment, scaffolding, and temporary structures located at the project site;

(e) Use its best efforts to sell, as directed or authorized by the CITY, any property transferred to the CITY under subsection (d) above; provided, however, that CONTRACTOR shall be liable to the CITY for any costs or losses incurred as a result of CONTRACTOR's failure to protect or maintain such property;

(f) Complete performance of any work not terminated;

(g) Secure the construction site and protect and preserve all CITY property and work in place;

(h) Provide the CITY and any replacement contractor(s) with reasonable cooperation, information, and assistance necessary to complete the construction work or transition the project, including but not limited to providing access to the site, information about subcontractors and suppliers, and details regarding construction methods and materials used;

(i) Remove from the project site all of CONTRACTOR's tools, construction equipment, machinery, and surplus materials as directed by the CITY;

(j) Take any other action that may be necessary, or that the CITY may direct, for the protection and preservation of CITY property and the construction project.

23.2.5 CITY'S RIGHTS TO COMPLETE THE WORK. After termination for cause, the CITY may:

(a) Take over the construction work and prosecute the same to completion by contract or otherwise;

(b) Complete the terminated portion of the work by whatever method the CITY deems expedient, including entering into agreements with other contractors;

(c) Withhold any payments to CONTRACTOR for the purpose of set-off or partial payment of amounts owed to the CITY;

(d) Take possession of and utilize, in completing the work, any materials, equipment, tools, supplies, construction equipment, and facilities belonging to CONTRACTOR that are on the project site and necessary for completion of the work.

23.2.6 EXCESS REPROCUREMENT COSTS AND LIABILITY. If the CITY terminates this Agreement for cause, CONTRACTOR shall be liable to the CITY for excess costs incurred by the CITY in completing the construction work. Excess costs shall include, but are not limited to:

(a) The costs to the CITY of completing the construction work under this Agreement, whether by hiring replacement contractor(s), performing the work with CITY forces, or any combination thereof;

(b) The difference between the total amount which would have been payable to CONTRACTOR under this Agreement and the total amount actually paid by the CITY to complete the work, including payments to replacement contractor(s);

(c) Additional administrative costs and expenses incurred by the CITY as a direct result of the default and termination, including but not limited to costs of procurement, construction management, inspection services, and project administration;

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(d) Costs associated with project delays, including extended general conditions, additional design fees, and escalation costs;
(e) Costs to correct defective or non-conforming work performed by CONTRACTOR;
(f) Reasonable attorneys' fees and costs incurred by the CITY in enforcing its rights under this Agreement; and
(g) Any other actual damages sustained by the CITY as a direct and proximate result of CONTRACTOR's default.

23.2.7 PAYMENT AFTER TERMINATION FOR CAUSE. After termination for cause and upon written demand, CONTRACTOR shall pay to the CITY the amount of excess costs as determined under Section 23.2.6. However, if the amount owed by CONTRACTOR exceeds the unpaid balance of the Agreement price, CONTRACTOR shall pay the excess to the CITY. Conversely, if the CITY's cost to complete the work is less than the unpaid balance of the Agreement price, the CITY shall pay the difference to CONTRACTOR, subject to any offsets for damages or other amounts owed to the CITY.

Subject to the excess cost provisions above, the CITY shall pay CONTRACTOR for:
(a) Completed work that has been accepted by the CITY prior to the effective date of termination, at the rate or price specified in this Agreement; and
(b) Reasonable costs incurred by CONTRACTOR in mobilization, procurement of materials, and performing the terminated work, to the extent such costs are properly allocable to the terminated portion of the Agreement, adequately documented, and approved by the CITY.

CONTRACTOR shall not be paid for:

- Work not accepted by the CITY;
- Defective or non-conforming work;
- Costs incurred due to CONTRACTOR's fault or negligence;
- Anticipated profit on unperformed work; or
- Consequential damages.

23.2.8 NO PAYMENT DURING DISPUTE. Notwithstanding any other provision of this Agreement, the CITY may withhold from amounts otherwise due to CONTRACTOR such sums as the CITY determines to be necessary to protect the CITY against loss due to outstanding liens or claims, defective work, failure to pay subcontractors or suppliers, or to reimburse the CITY for excess costs as provided in Section 23.2.6.

23.2.9 CONTRACTOR'S RIGHT TO DISPUTE TERMINATION. If CONTRACTOR disputes the termination for cause, CONTRACTOR must, within thirty (30) calendar days of receiving the notice of termination, provide written notice to the CITY of such dispute, specifying in detail the basis for the dispute. Failure to timely dispute the termination shall constitute CONTRACTOR's acceptance of the termination for cause and waiver of any right to contest it.

If CONTRACTOR timely disputes the termination, the matter shall be resolved in accordance with Article 25.1 (Governing Law) and Article 25.2 (Venue and Forum) of this Agreement.

23.2.10 CONVERSION TO TERMINATION FOR CONVENIENCE. If, after termination for cause under this Article 23.2, it is determined through agreement of the parties or by final judgment

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of a court of competent jurisdiction that:
(a) CONTRACTOR was not in default;
(b) The default was excusable; or
(c) The CITY wrongfully terminated the Agreement;
then the termination shall be deemed to have been a termination for convenience under Article 23.1 from the effective date of termination. In such case:

- The rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the CITY under Article 23.1;
- CONTRACTOR's sole remedy shall be payment in accordance with Article 23.1 (Termination for Convenience);
- CONTRACTOR shall not be entitled to recover anticipated profit on unperformed work, consequential damages, or any damages beyond those provided in Article 23.1; and
- The CITY shall not be liable for any excess costs of reprocurement.

23.2.11 CUMULATIVE REMEDIES. The rights and remedies of the CITY provided in this Article 23.2 are not exclusive and are in addition to any other rights and remedies provided by law, equity, or under this Agreement. Termination for cause shall not relieve CONTRACTOR from liability for any breach of this Agreement or from any indemnification obligations under Article 5.

23.2.12 NO LIABILITY FOR CONSEQUENTIAL DAMAGES. Except as expressly provided in Section 23.2.6 regarding excess reprocurement costs, neither party shall be liable to the other for consequential, incidental, indirect, or special damages arising out of or related to termination for cause, including but not limited to lost profits, lost business opportunities, or damage to reputation

ARTICLE 24: ASSIGNMENT

It is the intent of this Agreement to secure the personal services of Contractor and failure of Contractor for any reason to make the personal services available to the City of Fayetteville for the purposes described in this Agreement shall be cause for termination of this Agreement. Contractor shall not assign this Agreement without prior written consent of the City of Fayetteville.

ARTICLE 25: GOVERNING LAW AND VENUE

25.1 Governing Law

The validity, interpretation, and execution of this Agreement and the performance of and rights accruing under this Agreement are all to be governed by the laws of North Carolina.

25.2 Venue and Forum Selection

The Parties expressly agree that if litigation is brought in connection with this Agreement and (1) the litigation proceeds in the Courts of the State of North Carolina, the Parties agree that the appropriate venue shall be in Cumberland County (Fourteenth Judicial District of North Carolina);

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or (2) the litigation proceeds in a federal court, the Parties agree that the appropriate venue shall be the United States District Court for the Eastern District of North Carolina.

ARTICLE 26: COMPLIANCE WITH LAWS

Contractor agrees to comply with all applicable statutes, ordinances, and regulations of the United States, the State of North Carolina, the City and units of local government.

ARTICLE 27: REGULATORY CERTIFICATIONS

27.1 E-Verify

Contractor hereby acknowledges that "E-Verify" is the federal E-Verify program operated by the US Department of Homeland Security and other federal agencies which is used to verify the work authorization of newly hired employees pursuant to federal law and in accordance with Article 2, Chapter 64 of the North Carolina General Statutes. Contractor further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General Statutes, must use e-verify and after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS §64-26(a). Contractor hereby pledges, attests and warrants through execution of this Agreement that Contractor complies with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes and further pledges, attests and warrants that any subcontractors currently employed by or subsequently hired by Contractor shall comply with any and all E-Verify requirements. Failure to comply with the above requirements shall be considered a breach of this Agreement.

27.2 Divestment of Companies Boycotting Israel or Investing in Iran Certification

Contractor certifies that: (i) it is not identified on the Final Divestment List or any other list of prohibited investments created by the NC State Treasurer pursuant to N.C.G.S. 147-86.58; (ii) it has not been designated by the NC State Treasurer pursuant to N.C.G.S. 147-86.81 as a company engaged in the boycott of Israel ((i) and (ii) to be collectively referred to as "FD Lists"); and (iii) it will not take any action causing it to appear on the Treasurer's FD Lists created by the NC State Treasurer during the term of this Agreement. By signing this Agreement, Contractor further agrees, as an independent obligation, separate and apart from this Agreement, to reimburse the City for any and all damages, costs and attorneys' fees incurred by the City in connection with any claim that this Agreement or any part thereof is void due to Contractor appearing on the Treasurer's FD Lists at any time before or during the term of this Agreement.

ARTICLE 28: CITY OF FAYETTEVILLE GENERAL PROVISIONS

28.1 Severability

The Parties agree that if any provision of this Agreement shall be held invalid for any reason, the remaining provisions shall not be affected if they may continue to conform with the purposes of this Agreement and the requirements of applicable law.

28.2 Force Majeure

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Neither Party shall be deemed to be in default of its obligations hereunder if and so long as it is prevented from performing such obligations by an act of war, hostile foreign actions, adverse governmental actions, nuclear explosion, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

28.3 Morality Clause

If, in the sole opinion of the City, at any time Contractor any of its owner(s) or employee(s) or agent(s) (collectively referenced as an "Actor") engages in any one or more of the actions below, the City may immediately upon written notice to Contractor, terminate this Agreement, in addition to any other rights and remedies that the City may have hereunder or at law or in equity:

1. bring disrepute, contempt, scandal, or public ridicule to the Actor;
2. subject the Actor to prosecution;
3. offend the community or public morals/decency;
4. denigrate individuals or groups in the community served by the City;
5. is scandalous or inconsistent with community standards or good citizenship;
6. adversely affect the City's finances, public standing, image, or reputation;
7. is embarrassing or offensive to the City or may reflect unfavorably on the City; and,
8. is derogatory or offensive to one or more employee(s) or customer(s) of the City.

28.4 Non-Appropriation

Notwithstanding any other provisions of this Agreement, the Parties agree that payments due hereunder from the City are from appropriations and monies from the City Council and any other governmental entities. In the event sufficient appropriations or monies are not made available to the City to pay the terms of this Agreement for any fiscal year, this Agreement shall terminate immediately without further obligation of City.

28.5 Independent Contractor

Contractor is an Independent Contractor and shall undertake performance of the services pursuant to the terms of this Agreement as an Independent Contractor. Contractor shall be wholly responsible for the methods, means and techniques of performance. City shall have no right to supervise methods and techniques of performance employed by Contractor but City shall have the right to observe such performance.

28.6 Amendment

The City and Contractor may, from time to time, request changes in services to be performed by Contractor. Any such changes that are mutually agreed upon by the City and Contractor shall be incorporated herein by written amendment to this Agreement. It is mutually agreed and understood that no alteration or validation of the terms of this Agreement shall be valid unless made in writing and signed by the Parties hereto, and that any oral understanding or agreements not incorporated herein, unless made in writing and signed by the Parties hereto, shall not be binding.

28.7 Entire Agreement

This Agreement constitutes the entire agreement between the Parties. Any proposed change to this Agreement shall be submitted to the City for its prior approval. No modification, addition, deletion, etc., to this Agreement shall be effective unless and until such changes are reduced to writing and executed by the authorized officers of each Party.

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28.8 City's Terms Supersede

To the extent a conflict exists between the terms of this Agreement and the terms and conditions in any of the attachments to the Agreement, the terms of this Agreement shall govern.

28.9 Survival of Terms

All warranties, covenants, and representations contained within this contract and all applicable work authorizations, if any, shall continue in full force and effect for three (3) years after the execution and delivery of the final product, act, or service taken in furtherance of this Agreement. Survivability shall not be impacted, or otherwise shall not be rendered null or void, by the termination or natural expiration of this Agreement or other applicable work undertaken in furtherance of this Agreement. This Section does not extend or modify the warranty periods specified in Article 15 or applicable manufacturer warranties.

28.10 Singular/Plural

Whenever used herein, the singular shall include the plural, the plural the singular and the use of any gender shall be applicable to all genders as the context may require.

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Exhibits List

1. Proposal/Bid
2. Addendum Acknowledgment
3. Special Provisions and Specifications
4. Bond Forms
5. Licenses/Certifications
6. Lien Waiver Forms
7. Certificate of Insurance
8. Pay Application Form Example
9. Change Order Request Form Example

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Exhibit 1

Proposal/Bid

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Exhibit 2

Addendum Acknowledgment

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Exhibit 3

Special Provisions and Specifications

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Exhibit 4

Bond Forms

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Exhibit 5

Licenses/Certifications

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Exhibit 6

Lien Waiver Forms

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Exhibit 7

Certificate of Insurance

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Exhibit 8

Pay Application Form Example

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Exhibit 9

Change Order Request Form Example

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EXHIBIT 4A – PERFORMANCE BOND

EXHIBIT 4A — PERFORMANCE BOND — ATTACH AT CONTRACT EXECUTION

Performance Bond in the amount of 100% of the construction contract amount. Executed on the form provided in accordance with N.C.G.S. § 44A-33 and Chapter 44A, Article 3. The surety company must be authorized to do business in North Carolina and acceptable to the City Attorney. A.M. Best rating of A-VII or better required.

PERFORMANCE BOND

Date of Contract:_____

Date of Execution:_____

Name/Address of Principal:_____
_____

Name/Address of Surety:_____
_____

Name/Address of Contracting Body:_____
_____

Amount of Bond (Printed):_____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into a certain contract with the Contracting Body, identified as shown above and hereto attached:

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

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.

Executed in_____counterparts.

Witness:

_____
(Contractor: Trade or Corporate Name)

By: _____

_____
(Proprietorship or Partnership)

Title: _____
(Owner, Partner, or Corp. Pres. or Vice Pres. Only)

Attest: (Corporation)

By: _____

Title: _____
(Corp Sec or Ass't Sec Only)

(Corporate Seal)

Witness:

_____

_____
(Surety Company)

By: _____

Title: _____
(Attorney in Fact)

Countersigned:

_____

_____
(N.C. Licensed Resident Agent)

(Surety Corporate Seal)

_____

_____

_____
(Name and Address - Surety Agency)

_____

_____

_____
(Surety Company Name and NC Regional or Branch Office Address)

EXHIBIT 4B – PAYMENT BOND

EXHIBIT 4B — PAYMENT BOND — ATTACH AT CONTRACT EXECUTION

Payment Bond in the amount of 100% of the construction contract amount. Conditioned upon the prompt payment for all labor or materials for which the Contractor or subcontractor is liable. Executed in accordance with N.C.G.S. Chapter 44A, Article 3.

PAYMENT BOND

Date of Contract:_____

Date of Execution:_____

Name/Address of Principal:_____

_____

Name/Address of Surety:_____

_____

Name/Address of Contracting Body:_____

_____

Amount of Bond (Printed):_____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into a certain contract with the Contracting Body, identified as shown above and hereto attached:

NOW THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

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.

Executed in Counterparts

Witness:

_____ By: _____

(Contractor: Trade or Corporate Name)

_____ Title: _____

(Proprietorship or Partnership) (Owner, Partner, or Corp. Pres. or Vice Pres. Only)

Attest: (Corporation)

By: _____

Title: _____

(Corp Sec or Ass't Sec Only) (Corporate Seal)

Witness:

_____ _____

(Surety Company)

By: _____

Title: _____

(Attorney in Fact)

Countersigned:

_____ (Surety Corporate Seal)

_____

(N.C. Licensed Resident Agent)

_____

_____

_____

(Name and Address - Surety Agency)

_____

_____

_____

(Surety Company Name and NC Regional or Branch Office Address

EXHIBIT 4C – POWER OF ATTORNEY (SURETY)

EXHIBIT 4C — POWER OF ATTORNEY — ATTACH WITH BONDS AT CONTRACT EXECUTION

Power of Attorney from the surety company, authorizing the agent who signed the bonds to execute them on behalf of the surety.

EXHIBIT 7 – CERTIFICATE(S) OF INSURANCE

EXHIBIT 7 — CERTIFICATE(S) OF INSURANCE — SUBMIT WITH SIGNED CONTRACT

Certificates of insurance evidencing all coverage required under Contract Requirements, Section 4 (Insurance). City of Fayetteville must be named as Additional Insured. Certificates must include 30 days' prior written notice of cancellation. All insurers must be rated A-VII or better by A.M. Best.

NOTICE TO PROCEED (Issued by City — Not a Numbered Exhibit)

NOTICE TO PROCEED — ISSUED BY CITY AT AWARD (Not submitted by contractor; issued by Purchasing Manager after contract execution)

Written Notice to Proceed will be issued by the City of Fayetteville Purchasing Manager following contract execution and verification of all required insurance, bonds, and licenses. Contractor shall not commence work until the Notice to Proceed is received.

NOTICE TO PROCEED

TO:_____ **DATE:**_____

Project: McArthur Sports Complex Project

You are hereby notified to commence work in accordance with the Contract dated_____, on _____ _____, and you are to complete the WORK on_____.

CITY OF FAYETTEVILLE, NORTH CAROLINA

BY:_____
Kimberly Toon
Purchasing Manager

ACCEPTANCE OF NOTICE
Receipt of the above NOTICE TO PROCEED
is hereby acknowledged this the_____day
of_____, 2025.

(CONTRACTOR)

BY:_____

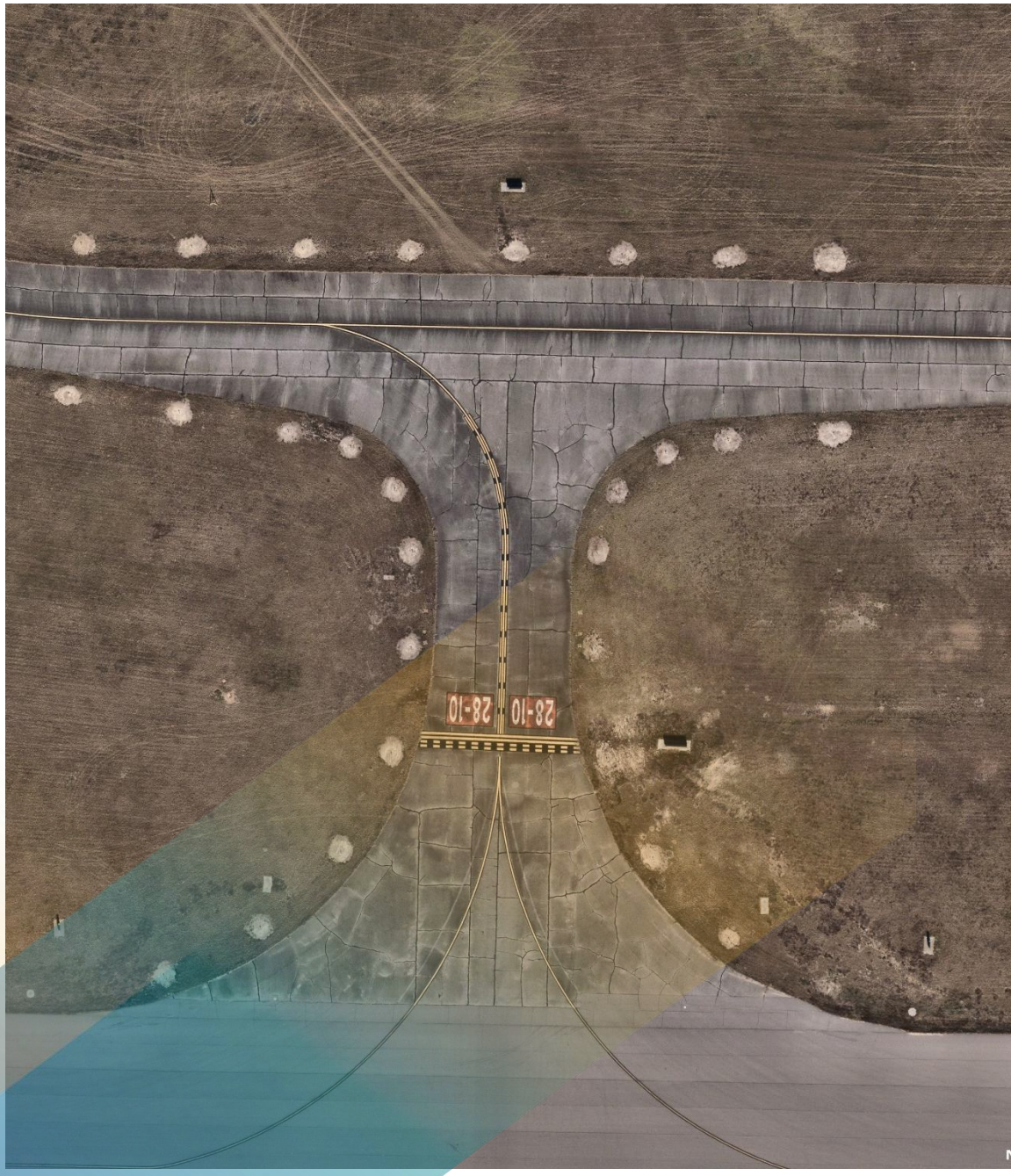
TITLE:_____

SECTION D – TECHNICAL SPECIFICATIONS

RS&H

April 2026

Rehabilitation of Taxiway Foxtrot and Golf
Project Manual – Civil and Electrical



Rehabilitation of Taxiway Foxtrot and Golf Project Manual Bidding Documents

April 2026
Raleigh, North Carolina
RS&H No.: 1003-1830-005

Prepared by RS&H, Inc.

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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.

Paragraph Number	Term	Definition
10-08	**ASTM International (ASTM)**	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	**Award**	The Owner's notice to the successful bidder of the acceptance of the submitted bid.
10-10	**Bidder**	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	**Building Area**	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	**Calendar Day**	Every day shown on the calendar.
10-13	**Certificate of Analysis (COA)**	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	**Certificate of Compliance (COC)**	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	**Change Order**	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	**Contract**	A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions,

Paragraph Number	Term	Definition
		standards incorporated by reference and issued addenda.
10-17	**Contract Item (Pay Item)**	A specific unit of work for which a price is provided in the contract.
10-18	**Contract Time**	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	**Contractor**	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	**Contractors Quality Control (QC) Facilities**	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	**Contractor Quality Control Program (CQCP)**	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	**Control Strip**	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	**Construction Safety and Phasing Plan (CSPP)**	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	**Drainage System**	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

Paragraph Number	Term	Definition
10-25	**Engineer**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	**Equipment**	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.
10-27	**Extra Work**	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	**FAA**	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	**Federal Specifications**	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared 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

Paragraph Number	Term	Definition
		RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.
10-32	**Lighting**	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	**Major and Minor Contract Items**	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	**Materials**	Any substance specified for use in the construction of the contract work.
10-35	**Modification of Standards (MOS)**	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	**Notice to Proceed (NTP)**	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	**Owner**	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the City of Fayetteville.
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

Paragraph Number	Term	Definition
		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.
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.

Paragraph Number	Term	Definition
10-48	**Quality Assurance (QA) Inspector**	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	**Quality Assurance (QA) Laboratory**	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	**Resident Project Representative (RPR)**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative. This role is the same as the Project Engineer.
10-51	**Runway**	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	**Runway Safety Area (RSA)**	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	**Safety Plan Compliance Document (SPCD)**	Details how the Contractor will comply with the CSPP.
10-54	**Specifications**	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	**Sponsor**	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a

Paragraph Number	Term	Definition
		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 RPR, and who shall supervise and direct the construction.
10-59	**Supplemental Agreement**	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	**Surety**	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	**Taxilane**	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	**Taxiway**	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

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.

END OF SECTION 10

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Section 40 Scope of Work

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

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

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

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

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

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

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

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

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

See Paragraph 22 CHANGE ORDERS of the Contract Requirements for information on the pricing and approval protocol for change orders.

See Paragraph 23 FORCE ACCOUNT WORK of the Contract Requirements for the fee and rate structure for force account work.

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (http://mutcd.fhwa.dot.gov/), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from

abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

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

a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,

b. Remove such material from the site, upon written approval of the RPR; or

c. Use such material for the Contractor's own temporary construction on site; or,

d. Use such material as intended by the terms of the contract.

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

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

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

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

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

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

END OF SECTION 40

Section 50 Control of Work

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

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

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

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

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

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

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

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as

though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

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

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

50-04 List of Special Provisions. Section A - Project Specifics and Section C – Administrative Provisions in the Invitation to Bid shall be considered the Special Provisions for this project.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

If the RPR requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the

work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

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

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

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

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

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

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

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

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

50-12 Maintenance during construction. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective

work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

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

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

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

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

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

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation within seven (7) days and before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost

of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

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

END OF SECTION 50

Section 60 Control of Materials

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

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

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

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

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

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

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

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

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

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's

COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

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

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

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

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

b. Suitability of the material or assembly for the use intended in the contract work.

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

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

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

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

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

b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

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

60-05 Engineer/ Resident Project Representative (RPR) field office. 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 RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner's permission.

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

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

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

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

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

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

END OF SECTION 60

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Section 70 Legal Regulations and Responsibility to Public

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

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

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

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. ~~To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows:.~~

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

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

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval

of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

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

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

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-05, *Maintenance of Traffic,* and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is on sheet(s) C011 to C015 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/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

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

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

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any

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

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

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work must be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified. Refer to the Sheet C014 the Contractor Phasing Plan for phasing schedule expectations.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.

No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

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

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

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

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

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

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

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

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

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's

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

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

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

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

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

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

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.

d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences.

The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

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

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

70-19 Environmental protection. The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section

40, paragraph 40-04, *Extra Work,* and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. Refer to the City of Fayetteville Invitation to Bidder Documents for Insurance Requirements.

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Section 90 Measurement and Payment

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

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet (0.8 square meters) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the RPR.

Unless otherwise specified, all contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

The term "lump sum" when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

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

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term "ton" will mean the short ton consisting of 2,000 pounds (907 km) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level

Term	Description
	capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
Plates and Sheets	The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
Miscellaneous Items	When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.
Scales	Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials

Term	Description
	received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%. In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded. Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.
Rental Equipment	Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work*.
Pay Quantities	When the estimated quantities for a specific portion of the work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the RPR. If revised dimensions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

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

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

90-03 Compensation for altered quantities. When the accepted quantities of work vary from the quantities in the proposal, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-02, *Alteration of Work and Quantities,* will be made for any increased expense, loss of expected reimbursement, or loss of anticipated

profits suffered or claimed by the Contractor which results directly from such alterations or indirectly from their own unbalanced allocation of overhead and profit among the contract items, or from any other cause.

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

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

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

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

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

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

a. From the total of the amount determined to be payable on a partial payment, 5 percent of such total amount will be deducted and retained by the Owner for protection of the Owner's interests. Unless otherwise instructed by the Owner, the amount retained by the Owner will be in effect until the final payment is made except as follows:

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

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

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

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

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

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

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

AIA forms and NC tax-exempt certification form required to be submitted with each payment request. See Contract Requirements for additional information regarding payments.

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

a. The material has been stored or stockpiled in a manner acceptable to the RPR at or on an approved site.

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

c. The Contractor has furnished the RPR with satisfactory evidence that the material and transportation costs have been paid.

d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.

e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

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

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

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

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

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

a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.

b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.

c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.

d. The Contractor shall obtain the written consent of the surety to such agreement.

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

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

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

90-10 Construction warranty.

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. 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.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.

h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

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

a. Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.

b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.

c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *Final Cleanup*.

d. Complete all punch list items identified during the Final Inspection.

e. Provide complete release of all claims for labor and material arising out of the Contract.

f. Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.

g. When applicable per state requirements, return copies of sales tax completion forms.

h. Manufacturer's certifications for all items incorporated in the work.

i. All required record drawings, as-built drawings or as-constructed drawings.

j. Project Operation and Maintenance (O&M) Manual(s).

k. Security for Construction Warranty.

l. Equipment commissioning documentation submitted, if required.

END OF SECTION 90

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Item GP-102 Safety and Security

GENERAL

102-1.1 The provisions of this safety and security plan and associated procedures are applicable within the boundaries of the Fayetteville Regional Airport. A complete understanding of all procedures and requirements contained herein is required to ensure safety during construction. The Airport has completed a Construction Safety and Phasing Plan (CSPP) that is provided as part of the project manual. It is required that the contractor comply with this CSPP at all times during the project. The contractor shall be required to submit for approval a Safety Plan Compliance Document (SPCD) which details how the contractor will comply with the CSPP. This safety plan is a part of this Contract and deviations from the requirements established herein will be sufficient cause for Contract termination.

Required reference material associated with this safety plan includes:

FAA AC 150/5200-18, latest version, Airport Safety Self-Inspection
FAA AC 150/5210-5, latest version, Painting, Marking and Lighting of Vehicles Used on an Airport
FAA AC 150/5370-2, latest version, Operational Safety on Airports during Construction
FAA AC 150/5370-13, latest version, Off-peak Construction of Airport Pavements Using Hot-Mix Asphalt

Copies of these documents are not included in the specifications. FAA Advisory Circulars can be found at:
http://www.faa.gov/airports/resources/advisory_circulars/

CONTRACTOR SAFETY AND SECURITY OFFICER

102-2.1 Contractor safety and security officer (CSSO). The Contractor shall appoint its on-site Construction Superintendent or other qualified individual(s) as its duly authorized representative to serve as Contractor Safety and Security Officer (CSSO) for the duration of the Contract. The CSSO shall thoroughly understand the safety and security requirements of the Contract, the necessity for them and shall have sufficient authority to implement its provisions without significant deviation. The Contractor shall notify the Engineer in writing of the name of the individual(s) selected for the assignment.

The CSSO shall represent the Contractor on safety and security requirements compliance. The CSSO shall be especially knowledgeable regarding the requirements of FAA AC's 150/5200-18, Airport Self Inspection Guide and 150/5370-2 Operational Safety on Airports during Construction, latest edition.

102-2.2 Responsibilities of the contractor safety and security officer. Prior to the desired date for commencement of any work on the project, the CSSO shall accomplish the following:

a. Develop and submit in writing a detailed work sequence schedule with dates and times

specified for all milestone events. This sequence schedule shall conform, as a minimum, to the events specified in Section 3.1, Construction Sequence, and shall be subject to the approval of the Engineer. **To assure adequate time for coordination, this document shall be submitted at least one week prior to the date of the Preconstruction Conference.**

b. Develop and submit in writing a detailed outline of the procedures to be followed to maintain safety and security of both Contractor operations and the integrity of airport landside and airside operations during the prosecution of contract work. This plan shall detail, in addition, the procedures to be followed in the event of an accident or fire involving Contractor personnel and the Contractor's efforts to maintain fire protection and security. These procedures shall be subject to the approval of the Engineer and reflect any change as may be deemed necessary.

c. Conduct at least one meeting of all Contractor supervisory personnel prior to the start of contract work. The purpose of this meeting is to review the approved Work sequence schedule and safety and security procedures. Attendance at this meeting by the CSSO, all Contractor supervisory personnel and the Engineer is mandatory. This meeting shall also be open to other employees of the Contractor and others as the Engineer may deem appropriate. Minutes of this meeting shall be taken by the CSSO, copies provided to each supervisor and kept on file in the Contractor's construction office for periodic review and updating.

d. Develop a safety and security orientation program and provide a briefing for all employees of the Contractor and subcontractors that will be used on the project. A similar briefing will be given to new employees prior to their use on contract work. In addition, the CSSO shall be responsible for briefing, from time to time, all Contractor personnel on any changes to safety and security measures deemed necessary.

e. Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supplying any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor that indicates it understands the operational safety requirements of the CSPP and it asserts it will not deviate from 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.

   a. 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:

i. **Coordination.** Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
ii. **Phasing.** Discuss proposed construction schedule elements, including:
    1. Duration of each phase.
    2. Daily start and finish of construction, including "night only" construction.
    3. Duration of construction activities during:
    4. Normal runway operations.
    5. Closed runway operations.
    6. Modified runway "Aircraft Reference Code" usage.
iii. **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.
iv. **Protection of NAVAIDs.** Discuss specific methods proposed to protect operating NAVAIDs.
v. **Contractor access.** Provide the following:
    1. Details on how the contractor will maintain the integrity of the airport security fence (daily log of construction personnel, and other).
    2. Listing of individuals requiring driver training (for certificated airports and as requested).
    3. Radio communications.
    4. Types of radios and backup capabilities.
    5. Who will be monitoring radios.
    6. Whom to contact if the ATCT cannot reach the contractor's designated person by radio.
    7. Details on how the contractor will escort material delivery vehicles.
vi. **Wildlife management.** Discuss the following:
    1. Methods and procedures to prevent wildlife attraction.
    2. Wildlife reporting procedures.
vii. **Foreign Object Debris (FOD) management.** Discuss equipment and methods for control of FOD, including construction debris and dust.
viii. **Hazardous material (HAZMAT) management.** Discuss equipment and methods for responding to hazardous spills.
ix. **Notification of construction activities.** Provide the following:
    1. Contractor points of contact.
    2. Contractor emergency contact.

3. 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.

x. **Inspection requirements.** Discuss daily (or more frequent) inspections and special inspection procedures.

xi. **Underground utilities.** Discuss proposed methods of identifying and protecting underground utilities.

xii. **Penalties.** Penalties should be identified in the CSPP and should not require an entry in the SPCD.

xiii. **Special conditions.** Discuss proposed actions for each special condition identified in the CSPP.

xiv. **Runway and taxiway visual aids.** Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:

1. Equipment and methods for covering signage and airfield lights.
2. Equipment and methods for temporary closure markings (paint, fabric, other)

xv. **Marking and signs for access routes.** Discuss proposed methods of demarcating access routes for vehicle drivers.

xvi. **Hazard marking and lighting.** Discuss proposed equipment and methods for identifying excavation areas.

xvii. **Protection of runway and taxiway safety areas.** Including object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:

1. Equipment and methods for maintaining Taxiway Safety Area standards.
2. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.

xviii. **Other limitations on construction** should be identified in the CSPP and should not require an entry in the SPCD.

b. **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.

c. **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. Contractor shall provide 24-hour coverage.

d. **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 whenever active construction is taking place.

e. **Conduct inspections** sufficiently frequently to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

f. **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.

g. **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.

h. **The Contractor shall submit and receive approval of SPCD prior to issuance of Notice to Proceed.**

CONSTRUCTION SEQUENCING

102-3.1 Construction sequence. The Contractor shall prepare a construction schedule and submit to the Engineer at least one week prior to the pre-construction conference.

102-3.2 Phasing coordination meetings. The contractor shall attend a mandatory Phasing Coordination Meeting for each construction phase and sub-phase. The meetings shall be held at least 7 days in advance of beginning the next construction phase of the project. At a minimum, it is required that the Project Superintendent, Project Engineer, and all construction foreman of the prime contractor and all subcontractors attend.

102-3.3 Closing airfield pavements. The Contractor shall acquaint his supervisors and employees with the sequence of construction and its relationship to airport activity and aircraft operations that are inherent to this airport. No runway, taxiway, apron or airport roadway shall be closed without the written approval of the Owner, to enable necessary NOTAMS and/or advisories to airport fixed based operators (FBOs), tenants and users.

The Contractor shall contact the Engineer and the Owner a minimum of 48 hours prior to any requested closing.

Any construction activity within an active runway safety area or within an active taxiway object free area requires the closure of the affected area. These areas are shown on the phasing plan.

The Engineer will arrange for an inspection prior to return to service of any facility, that has been closed for work, on or adjacent thereto, or that has been used for a crossing point or haul route by the Contractor.

MARKING AND LIGHTING

102-4.1 Proper marking and lighting of areas on the airfield associated with the construction shall be the responsibility of the Contractor. This will include properly marking and lighting closed runways, taxiways, taxilanes, and aprons, the limits of construction, material storage areas, equipment storage areas, haul routes, parking areas and other areas defined as required for the Contractor's exclusive use. The Contractor shall erect and maintain around the perimeter of these areas suitable marking and warning devices visible for day and night use. Temporary barricades, flagging, and flashing warning lights shall be required at critical access points. The type and location of marking and warning devices will be approved by the Engineer.

Special emphasis shall be given to open trenches, excavations, heavy equipment marshalling areas, and stockpiled material located in the airport operations area, which shall be predominantly marked by the Contractor with flags and lighted by approved light units during hours of restricted visibility and darkness. All marking shall be in accordance with FAA Advisory Circular (AC) 150/5340-1M or latest edition.

TRAFFIC CONTROL

102-5.1 Vehicle identification. Refer to Special Conditions for all vehicle identification requirements.

102-5.2 Access to the site of construction. The Contractor's access to the site shall be as shown on the Contractor Access Plan. No other access points shall be allowed unless approved by the Engineer or Airport Operations Personnel. All Contractor traffic authorized to enter the site shall be experienced in the route or guided by Contractor personnel or Airport Operations Personnel. The Contractor shall be responsible for traffic control to and from the various construction areas on the site, and for the operation and security of the access gate to the site. The Contractor shall not permit any unauthorized construction personnel or traffic on the site. The access gate shall only be operated by badged contractor personnel driving a vehicle marking with the appropriate hazard lights and identification. The gate may not remain open. Leaving the access gate open shall constitute grounds for identification revocation and expulsion from the project. The Contractor is responsible for the immediate cleanup of any debris deposited along the access route as a result of his construction traffic. Directional signing from the access gate along the delivery route to the storage area, plant site or work site shall be as directed by the Engineer. In addition, the following requirements are applicable:

a. All Contractor traffic authorized to travel on the airport shall have been briefed as part of the Contractor's construction safety and security orientation program, be thoroughly familiar with the access procedures and route for travel or be escorted by personnel authorized by the Contractor Safety and Security Officer (CSSO). Only badged personnel may drive through the AOA gate unless escorted by Airport Operations Personnel.

b. The Contractor shall install work site identification signs at the authorized access point(s). If, in the opinion of the Engineer, directional signs are needed for clarity, they shall be installed along the route authorized for access to each construction site.

c. Under no circumstance will Contractor personnel be permitted to drive their individually owned vehicles to any construction site on the airport. All vehicles must be parked in the area designated for employee parking and out of secured airport property.

d. In addition to the inspection and cleanup required at the end of each shift, the Contractor is responsible for the immediate cleanup of any debris generated along the construction site access route(s) as a result of construction related traffic or operations whether or not created by Contractor personnel.

102-5.3 Material suppliers. All material suppliers, subcontractors and visitors to the work site are obligated to follow the same safety and security operating procedures as the Contractor. All material suppliers shall make their deliveries using the same access points and routes as the Contractor and shall be advised of the appropriate delivery procedures at the time the materials order is placed. The Contractor shall not use the Airport address for any delivery but shall use the street address appropriate to the location of the entrance of the work site. If it is not practical to conform to the vehicle identification requirements of Section 102-5.1 and the safety and security operations program requirements of Section 102-2.2, the Contractor shall be prepared to escort all suppliers, subcontractors and visitors while they are on the airport.

102-5.4 Personnel. All employees, agents, vendors, invitees, etc. of the Contractor or subcontractors requiring access to the construction site shall conform to the Airport Security Program at all times.

GENERAL SAFETY REQUIREMENTS

102-6.1 All Contractor vehicles that are authorized to operate on the airport inside of the designated construction area limits or haul routes as defined herein shall display in full view above the vehicle a flashing amber (yellow) dome-type light or a three-foot by three-foot, or larger, orange and white checkerboard flag, each checkerboard color being one-foot square. Vehicles must be under control of a Contractor mobile (two-way) radio operator (flagmen) monitoring the Airport frequency. Vehicle operators must be vigilant for conflict with any aircraft and give way to any operating aircraft.

All Contractor vehicles that are required to operate outside of the construction area limits as defined herein and cross active runways, taxiways, aprons, or runway approach clear zones shall do so under the direct control of a flagman who is monitoring the Airport frequency. Flagmen and two-way radios shall be furnished by the Contractor.

Construction vehicles not in use for extended periods during the work day, or during nights and weekends (nonwork periods) shall be parked in the Contractor staging area.

Refer to Special Conditions and plans for additional requirements.

102-6.2 The Contractor is responsible for dust control of the construction site. If proper dust control is not maintained in the opinion of the RPR, the Owner can require a vacuum truck at no

additional cost to the Owner.

CONSTRUCTION CONTROL

102-7.1 A primary and alternate responsible Contractor's representative shall be designated by the Contractor. The Contractor's representatives shall be available locally on a 24-hour basis. Names of the primary and alternate, including phone number, shall be made available to the Engineer by the Contractor. The Contractor shall insure that the names and phone numbers are kept current and made available to the Engineer.

102-7.2 Emergency contact personnel. The Contractor shall provide, at a minimum, the phone numbers of three (3) personnel, including the project superintendent, who may be contacted in an emergency. Personnel shall be on call 24 hours per day for maintaining construction hazard lighting and barricades. The Contractor shall employ watchmen to maintain and service all traffic control equipment only during contractor working hours and during non-working emergencies.

CONSTRUCTION TECHNIQUES

102-8.1 Construction shall be planned and conducted throughout this project in such a manner as to allow the maintenance of completely safe airport operations. Every effort shall be made to reduce the impact of construction activity on overall airport operations. To this end the Contractor's activities shall be conducted in such a manner so as to preclude, except where absolutely required, open excavations, trenches, ditches and above ground obstacles such as booms on cranes or obstacle markers such as wooden saw horses. The primary responsibility for assuring that the safest possible construction techniques are followed rests with the Contractor Safety and Security Officer (CSSO).

METHOD OF MEASUREMENT

102-9.1 The item of Safety and Security shall be measured as a lump sum item when required and furnished for the life of the Contract.

BASIS OF PAYMENT

102-10.1 Payment shall be made for airport safety and security measures for personnel or materials related to this specification item and incidentally required to satisfy the specified objective(s) under item GP-102-10.1, Safety and Security. This compensation shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

PARTIAL PAYMENTS. Partial payments will be made in accordance with the following:

Percentage of Original Contract Earned	Allowable Percent of the Lump Sum Price for the Item
5	15
15	20

25	25
50	50
75	75
100 (or Contract Completion)	100

Payment shall be made under:

Item GP-102-1	Safety and Security - Per Lump Sum.

TESTING REQUIREMENTS

102-11.1 None.

END OF ITEM GP-102

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Item GP-103 Temporary Construction Items

DESCRIPTION

103-1.1 This item consists of furnishing all labor, materials and equipment for temporary construction items necessary for the safe and proper execution of work and not otherwise included in other contract bid items. The Contractor will be expected to supply and utilize the items listed below and other items contained in the plans and specifications. Temporary construction items to be provided include, but are not limited to the following: flaggers, portable floodlighting, steel plates for temporary covering of excavations and structures as required, construction barricades, test pitting, and men and equipment as needed to keep all areas free of debris.

MATERIALS

103-2.1 Construction barricades. Construction barricades shall be constructed in accordance with the details shown in the plans and shall be placed in accordance with the phasing plans and phasing notes drawings.

103-2.2 Portable floodlighting. Portable floodlighting shall be provided, as required, for construction that must occur during nighttime operations. The Contractor shall provide sufficient units so that all work areas are illuminated to a level of 5 horizontal footcandles. The lighting levels shall be calculated and measured in accordance with the current standards of the Illumination Engineering Society.

103-2.3 Other miscellaneous items. Any other items not listed herein but which are associated directly or indirectly with temporary construction-related work shall, by reference, be included in the requirements of this specification. No additional payment will be made for any temporary construction related item not specifically listed herein. The Contractor shall be responsible for providing any and all items necessary to ensure a safe, secure and functioning project construction site.

103-2.4 Lighted Runway Closure Markers. Two (2), diesel powered, lighted closure markers will be provided by the Owner. The Contractor will be required to maintain the markers and provide enough fuel for their proper operation during the construction schedule. Runway closures will not be permitted without properly working Closure Markers. No additional time will be allotted to the contract or construction schedule in the event the Closure Markers are out of service or not in proper working order. Closure Markers that are found to not be in working order during a night closure will require immediate repair. The Contractor shall not be permitted to work in areas requiring runway closure when Closure Markers are not functioning properly. It is recommended that the Contractor provide back-up Closure Markers as necessary to facilitate the work and construction schedule. Closure Markers shall be returned to the airport at any point during construction and permanently upon completion of the project.

103-2.5 Maintenance of Traffic on Public Roadways. Contractor shall conform to all applicable NCDOT requirements when using public roadways and/or where the project's construction traffic

enters and exits public roadways. When required by local/state regulations, the Contractor shall secure required permitting for the use of public roadways and/or procure the appropriate signage indicating hauling routes, construction entrance locations, or locations where trucks will be entering/existing roadways to and from Airport property. Lane closures and road closures required shall conform to all applicable NCDOT requirements and closure times as indicated on the plans and as coordinated with the RPR and NCDOT. The RPR reserves the right to require additional traffic control measures at the sole discretion of the RPR and/or Owner.

The Contractor shall document conditions of all haul routes, airport access roads, and roadways impacted by construction traffic to record their existing condition prior to the start of construction. These records shall be submitted for record by the Contractor and presented to the RPR when requested to ensure the access routes are properly returned to the pre-project conditions. Contractor shall protect and restore all existing roads impacted by the Contractor to original condition at end of the project, to the satisfaction of the RPR.

Construction signage to be placed shall be at physical locations where traffic will enter/exit public roads in each direction. The Contractor shall also be required to place signage and applicable traffic control measures at defined distances away from egress points to alert public traffic of upcoming construction access on either side of that entrance. Signage and traffic control measures to be installed shall be per applicable NCDOT standards, with locations approved by the RPR prior to construction. At no time shall the Contractor enter public roadways without signage and applicable measures being in place and approved. Signage shall be accompanied by strobe lighting as required by NCDOT standards during dusk/dawn/night construction. Lighting shall remain operational during construction.

103-2.6 Fabric Taxiway Closure Marker. The Fabric Taxiway Closure Marker shall be constructed from vinyl windscreen or equivalent material able to be securely fastened to pavement courses, or held down with sandbags. The marker shall be placed on the temporarily closed taxiway per FAA AC 150/5370-2G Section 2.18.2.1.4 and per FAA AC 150/5340-1M. The color of the fabric shall be yellow in accordance with Item P-620 and shall be non-reflective.

CONSTRUCTION METHODS

103-3.1 Construction barricades. Barricades shall be placed around each phase of the work in accordance with the phasing plans and shall remain in place until completion of work in each phase. All barricades shall be provided and maintained by the Contractor.

103-3.2 Flaggers. Flaggers shall be provided, as necessary, to control the Contractor's traffic during the prosecution of work. All Contractor vehicles or equipment that are required to cross active airfield pavement or safety areas shall do so under the direct control of a RDU movement badged flagger. Any flaggers used on public roadways shall conform to all NCDOT standards. Flagger are not expected for this project.

103-3.3 Portable floodlighting. Portable floodlighting is required for construction during periods of limited visibility (i.e., nighttime). Illumination requirements shall be those contained in Paragraph 103-2.2.

103-3.4 Temporary site access stabilization. Temporary site stabilization shall be constructed in compliance with erosion and sedimentation control standards.

103-3.5 Lighted Runway Closure Markers. Provided by the Owner, refer to Section 103-2.5.

103-3.6 Miscellaneous. On-airfield temporary orange construction signs shall be used to alert pilots of taxiing aircraft about temporary, changed conditions on the airfield. Signs shall meet the requirements of FAA *Engineering Brief 93: Guidance for the Assembly and Installation of Temporary Orange Construction Signs* and shall be placed in accordance with the Phasing and Haul Route plans and associated details.

All signage, and necessary lighting, marking, etc. shall be maintained throughout construction and shall be removed upon completion of the Contract.

METHOD OF MEASUREMENT

103-4.1 Temporary construction items. Payment for Temporary Construction Items will be measured for payment on a lump sum basis.

103-4.2 Temporary site access stabilization. No separate payment will be made for the Contractor's utilization of asphalt millings or gravel in maintaining all roadways, haul routes, and access roads impacted by the Contractor.

103-4.3 Lighted Runway Closure Markers. Lighted Runway Closure Markers shall not be measured for payment and shall be incidental to 103-4.1.

103-4.4 Taxiway Closure Markers. Taxiway Closure Marker Devices and Fabric Taxiway Closure Markers shall not be measured for payment and shall be incidental to 103-4.1.

103-4.5 Maintenance of Traffic on Public Roadways. Maintenance of traffic on public roadways for purposes of hauling routes and airport site access is considered incidental to Item 103-4.1.

BASIS OF PAYMENT

103-5.1 Temporary Construction Items. Payment will be made at the lump sum bid price for "Temporary Construction Items." This payment shall be full compensation for furnishing all materials and labor for placing, moving and removing construction barricades, providing flaggers (if needed), furnishing portable floodlighting, test pitting, site access stabilization, and for any other labor, materials, equipment, tools and incidentals necessary for temporary items required for construction of this work.

Payment for this item will be made in installments. The first payment of 10 percent of the lump sum price will be included in the first progress estimate following the initiation of construction work. The remaining 90 percent of the lump sum price will be included as installments in subsequent progress estimates. Each such installment will be determined based on the ratio of the total work completed to date of the total contract amount.

Payment will be made under:

Item GP-103-1	Temporary Construction Items - Per Lump Sum

TESTING REQUIREMENTS

103-6.1 As required.

END OF ITEM GP-103

Item GP-104 Project Survey and Stakeout

DESCRIPTION

104-1.1 Under this item, the Contractor shall do all necessary surveying required to construct all elements of the work as shown on the Contract Drawings and specified in the proposal and specifications. This shall include but not be limited to stakeout, layout and elevations for pavements, structures, forms and appurtenances as shown and required, consistent with the current practices and shall be performed by qualified personnel acceptable to the Engineer. The stakeout survey shall proceed immediately following the award of the Contract or as soon as authorized by the Owner and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the stakeout survey. All survey work shall be provided under the direction of a licensed land surveyor.

MATERIALS

104-2.1 All instruments, equipment, stakes and any other material necessary to perform the work satisfactorily shall be provided by the Contractor.

All stakes used shall be of a type approved by the Engineer. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

CONSTRUCTION METHODS

104-3.1 The Contractor shall trim trees, brush and other interfering objects, not inconsistent with the Contract Drawings, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stakeout survey crews.

The exact position of all work shall be established from control points, baseline transit points or other points of similar nature that are shown on the Contract Drawings and/or modified by the Engineer. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required prior to proceeding with construction. The Contractor shall ensure the Engineer is notified of any discrepancies with adequate time for the Engineer to conduct a detailed review, analysis, and recommendation prior to the commencement of any major contract activities.

The Contractor shall place two offset stakes or references at each centerline station and at such intermediate locations as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly and legibly marked with the correct centerline station number, offset and cut or fill so as to permit the establishment of the exact centerline location and elevation during construction. If markings become faded or blurred for any reason, the markings shall be restored by the Contractor at the request of the Engineer. He shall locate and place all cut, fill, slope, fine grade or other stakes and points, as the Engineer may direct, for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.

Existing drainage structures shall be staked out by the Contractor at the locations and elevations shown on the Contract Drawings or specified by the Engineer.

Reference points, baselines, stakes and benchmarks for borrow pits shall be established by the Contractor. Permanent survey marker locations shall be established in areas not subject to damage from construction or traffic and referenced by the Contractor. The Contractor shall verify the survey marker prior to use to ensure no movement has occurred.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc., throughout the life of the work. Damaged or destroyed points, benchmarks or stakes, or any reference points made inaccessible by the progress of the construction, shall be replaced or transferred by the Contractor. Any of the above points which may be destroyed or damaged shall be transferred by the Contractor before they are damaged or destroyed. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the Engineer immediately. All stakeout survey work shall be referenced to the centerlines shown on the Contract Drawings. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work, shall be neatly made. Such computations, survey notes and other records shall be made available to the Engineer upon request and shall become the property of the Owner and delivered to the Engineer not later than the date of acceptance of the Contract.

The Contractor shall furnish, at his expense, all horizontal and vertical control, all staking and layout of construction work called for on the plans and the Engineer and Owner shall not be responsible for such work. However, the Owner and Engineer reserve the right to check all said lines, grades, and measurements with their appointed surveyor. Should the Owner’s surveyor detect errors in said lines, grades, and measurements, the Contractor shall pay for all said surveying costs and subsequent surveying costs performed to verify correction of errors found in said lines, grades and measurements. Included in this are all blue top staking for subgrade and base course installation. Definition of an error shall be a discrepancy of 1/4" or more. In the case of a discrepancy between the technical specifications and this defined tolerance, this tolerance shall govern.

Prior to the final cross-section survey of the work by the Contractor, the Contractor shall reestablish centerline or baseline points and stationing as required by the Engineer.

During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stakeout incidental to the proper location by line and grade for each phase of the work. For paving and any other operation requiring extreme accuracy, the Contractor will restake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer. Unless otherwise noted, the contractor will perform pavement surveys using a 25 foot grid pattern along the taxiway centerline or as indicated by the elevations plans provided for each lift.

Any existing stakes, iron pins, survey monuments or other markers defining property lines which may be disturbed during construction shall be properly tied into fixed reference points before being disturbed and accurately reset in their proper position upon completion of the work.

Just prior to completion of the work, the Contractor shall reestablish, if necessary, and retie all control points as permanently as possible and to the satisfaction of the Engineer.

104-3.2 The Contractor shall submit a draft electronic survey to the Engineer within 48 hours of the survey data being taken, and a sealed survey within five business days of the draft electronic survey being transmitted. This applies to all survey data taken during construction. The Contractor must give daily copies of all survey notes to the Engineer so that the Engineer may check them as to accuracy and method of staking. All areas that are staked by the Contractor must be checked by the Engineer prior to beginning any work in the area. The Engineer will make periodic checks of the grades and alignment set by the Contractor. In case of error on the part of the Contractor, or his/her employees, resulting in establishing grades and/or alignment that are not in accordance with the plans or established by the Engineer, all construction not in accordance with the established grades and/or alignment shall be replaced without additional cost to the Owner.

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

Construction Staking and Layout includes but is not limited to:

Clearing and grubbing perimeter staking.

Rough Grade slope stakes at 100-foot stations.

Drainage Swales not used.

Subgrade blue tops at 15-foot stations and 10-foot offset distance (max.) for the following section locations:

a) Runway – not used.
b) Taxiways – minimum 3 per station
c) Holding apron areas – not used.
d) Roadways – not used.

Base Course blue tops placed to match elevation plan grid pattern which supercedes the following at 25 foot stations and 25-foot offset distance (max.) for the following section locations:

a. Runway – minimum 5 per station
b. Taxiways – minimum 3 per station
c. Holding apron areas – not used.

Pavement areas:

a. Edge of Pavement hubs and tacks (for stringline by Contractor) at 100-foot stations
b. Between Lifts placed to match elevation plan grid pattern which supersedes the

following at 25-foot stations for the following section locations:

(1). Runways – each paving lane width

(2). Taxiways – each paving lane width

(3). Holding areas – each paving lane width

c. After finish paving operations at 50-foot stations

(1). All paved areas – Edge of each paving lane prior to next paving lot

d. Shoulder and safety area blue tops at 50-foot stations and at all break points with maximum of 50-foot offsets

Fence lines not used.

Electrical and Communications System locations, lines and grades including but not limited to duct runs, connections, fixtures, signs, lights, VASIs, PAPIs, REILs, Wind Cones, Distance Markers (signs), pull boxes and manholes.

Drain lines, cut stakes and alignment on 25-foot stations, inlet and manholes, including all inverts.

Painting and Striping layout (pinned with 1.5 in PK nails) marked for paint Contractor. (All nails shall be removed after painting)

Laser, or other automatic control devices, shall be checked with temporary control point or grade hub at a minimum of once per 400 feet per pass (that is, paving lane).

Note: Controls and stakes disturbed or suspect of having been disturbed shall be checked and/or reset as directed by the Engineer without additional cost to the Owner.

The Contractor shall be required to submit cross sectional data to the Engineer at monthly intervals prior to the Contractor submittal of the monthly application for payment so that the Engineer can verify the quantities of various earthwork and materials volumes for payment. All cross-sectional data provided at any time will be in Civil3D 2018 format only as a 3D surface model as well as a LandXML file or .txt file tied to the correct datums. No other formats will be accepted. If the data is submitted in another format other than Civil 3D, no earthwork or other materials volumes will be calculated and approved for payment. The earthwork shall include, but not be limited to, unclassified excavation, embankment, new or existing subbase courses, new or existing base courses, sand/asphalt subgrade, topsoil, etc. The Contractor shall submit all survey points in a .txt file format, LandXML format, or spreadsheet format such as Microsoft Excel.

The Contractor is responsible for verifying all existing elevations at proposed pavement tie ins prior to the start of construction in that area. If there is a discrepancy at pavement tie ins, the Contractor shall notify the Engineer immediately and prior to performing the related work.

METHOD OF MEASUREMENT

104-4.1 Project Survey and Stakeout shall be incidental to the associated work being performed, cold millings, milling placement, asphalt surface course, and all others as specified in each specification.

104-4.2 Permanent Survey Benchmarks will not be used.

BASIS OF PAYMENT

104-5.1 Project Survey and Stakeout shall include the cost of furnishing all labor, equipment, instruments and all other material necessary to satisfactorily complete the work's surveying and stakeout. Partial payments will be made at the discretion of the Engineer as the work progresses based generally on the percentage of actual work completed compared to the total construction cost.

104-5.2 Permanent Survey Benchmarks will not be used.

TESTING REQUIREMENTS

104-6.1 None.

END OF ITEM GP-104

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Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 14 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for

each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

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

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

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

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

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

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

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard*

Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

- 7 Test Methods and Procedures
- 8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

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

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

b. Item description (e.g., Hot Mix Asphalt Pavements)

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

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

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

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

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

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the

terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

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

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

(8) Photographs and/or video

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

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description

(2) Test designation

(3) Location

(4) Date of test

(5) Control requirements

(6) Test results

(7) Causes for rejection

(8) Recommended remedial actions

(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

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

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

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 20%.

d. When 75% or more of the original contract is earned, an additional 20%.

e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100-1 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 Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

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

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

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

MATERIALS

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

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

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

102-2.4 Slope drains. Not Used.

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

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

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

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

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

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

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

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

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

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

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

METHOD OF MEASUREMENT

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

a. Temporary seeding and mulching will be measured by the square yard. Fertilizer required for seeding shall be incidental to the temporary seeding and mulching pay item

b. Installation and removal of compost sock will be measured by the linear foot.

c. Installation and removal of rock pipe inlet protection will be measured per each installed as directed.

d. Installation and removal of drop inlet protection will be measured per each installed as directed.

c. Installation and removal of silt fence shall be incidental to mobilization for areas of installation within the staging area.

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

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-1	Temporary seeding and mulching - per square yard
Item C-102-2	Installation and removal of compost sock - per linear feet
Item C-102-3	Installation and removal of rock pipe inlet protection – per each

FAA AC 150/5370-10H

Item C-102-4 Installation and removal of drop inlet protection – per each

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

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

REFERENCES

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

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

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

END OF ITEM C-102

Item C-105 Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. 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.

FAA AC 150/5370-10H

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

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

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (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:

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

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

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

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

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

PWL = 98

B. PWL Determination for Air Voids.

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

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

2. Calculate the average air voids for the lot.

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

3. Calculate the standard deviation S_n for the lot.

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

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

$S_n = 1.12$

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

$Q_L = (X - L) / S_n$

$Q_L = (3.57 - 2.00) / 1.12$

$Q_L = 1.3992$

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

$P_L = 97$

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

$Q_U = (U - X) / S_n$

$Q_U = (5.00 - 3.57) / 1.12$

$Q_U = 1.2702$

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

$P_U = 93$

8. Calculate Air Voids PWL

$PWL = (P_L + P_U) - 100$

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

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

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

A-3 = 99.30

A-4 = 98.35

A-2 = 97.55

A-1 = 96.60

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

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

a. For measurements greater than the average:

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

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

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

b. For measurements less than the average:

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

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

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

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

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

OR

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

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

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980

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
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

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
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 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement.-The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. No waste material produced from concrete removal may be wasted on-site.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

The waste material shall be legally disposed of off-site in a timely manner following removal. The area shall be backfilled with materials equal to or better in quality than adjacent backfill and brought to proposed grade per the plans. All backfill must be compacted to 95% of ASTM D698.

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. No waste material produced from asphalt pavement removal may be wasted on-site. The waste material shall be legally disposed of off-site in a timely manner following removal. The area shall be backfilled

with materials equal to or better in quality than adjacent backfill and brought to proposed grade per the plans. If the area will be used for new full depth pavement, construct area per the plans.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Not Used.

101-3.3 Removal of Foreign Substances/contaminates prior to seal-coat and remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction. High-pressure water and sandblasting may be used. 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 (3 mm) deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. Not Used.

b. Asphalt pavement repair. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 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 in areas designated 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 RPR shall layout the area to be milled with a straightedge in increments of 1-foot (30 cm) widths. The area to be milled shall cover only the failed area. Any excessive area

that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of in areas designated on the plans.

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 in areas designated 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 RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Not Used.

101-3.8.1 Removal of Existing Joint Sealant. Not Used.

101-3.8.2 Cleaning prior to sealing. Not Used.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with Item P-605.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router by removing a minimum of 1/16 inch (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. Following routing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. Not used.

b. Removal of Inlets/Manholes. Not used.

c. Removal of Concrete Flumes. As indicated on the plans. The waste material shall be legally disposed of off-site in a timely manner following removal. The area shall be backfilled with materials equal to or better in quality than adjacent backfill and brought to proposed grade per the plans. All backfill must be compacted to 95% of ASTM D698.

d. Removal of Sign Base Foundations. Existing sign bases shall be removed as indicated on the plans. The waste material shall be legally disposed of off-site in a timely manner following removal. The area shall be backfilled with materials equal to or better in quality than adjacent backfill and brought to proposed grade per the plans. All backfill must be compacted to 95% of ASTM D698.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal. Backfill associated with pavement removal shall be incidental to the associated pavement removal pay item including backfill that requires final grade to be met outside the original limits of pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be incidental to the item in which joint and crack repair is applied.

101-4.3 Removal of Foreign Substances/contaminates. This shall be incidental to surface preparation. Refer to specification P-620.

101-4.4 Spalled and failed asphalt pavement repair. This shall be incidental to the cold milling pay item.

101-4.5 Concrete Spall Repair. Not Used.

101-4.6 Cold milling. The unit of measure for cold milling shall be per square yard at an average depth of 4 inches. The location and 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 as directed by the RPR and will be paid for the total depth of milling.

101-4.7 Removal of Pipe and other Buried Structures. The unit of measurement for removal of other buried structures will be made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4. Backfill required to bring the area of structure removal shall be considered incidental to the removal activity including additional backfill needed to bring the entire area to meet final grade in which removal activity occurred with the associated buried structure.

101-4.7 Millings Placement for Radar Road. The unit of measure for placement of millings shall be 6 inches of millings after compaction. Millings shall be placed in two 3-inch lifts and measured per square yard at 6 inch depth following compaction.

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 Shoulder Full Depth Pavement Removal (1.5-inch Depth) - per square yard
Item P-101-2	Vehicle Service Road Full Depth Pavement Removal (Up to 9-inch Depth) – per square yard
Item P-101-3	Asphalt Taxiway Full Depth Pavement Removal (Up to 9-inch Depth) – per square yard
Item P-101-4	Cold Milling (4-inch Depth) – per square yard
Item P-101-5	Millings Placement for Radar Road (Compacted in Place) – per square yard
Item P-101-6	Concrete Flume Removal – 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.

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. Subgrade Preparation: Subgrade preparation consists of preparing the finished subgrade of the earthwork to meet the requirements of this specification prior to the installation of pavement or turf.

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed of legally off airport property. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item T-905.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of off site according to local, state, and federal regulations or on-site as directed and approved only by the Owner or RPR. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches, to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder**.**

Existing grades on the design DTMs, 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 (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm**)** for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design DTMs.

Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of legally off site.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed off the airport. The cost is incidental to this item. 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. Undercutting will be paid as unclassified excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. Borrow areas are not required.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor

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

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches (300 mm)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 D698. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill.

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

152-2.7 Control Strip. Not Used.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 12 inches of compacted thickness.

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

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The contractor will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D698. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the contractor for every day of work completed for compacted embankment for each lift which is required to be compacted with a minimum of three (3) tests, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) 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 698. Under all areas to be paved, the embankments shall be compacted to a depth of 12 inches and to a density of not less than 100 percent of the maximum density as determined by ASTM 698. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor’s laboratory shall perform all density tests in the RPR’s presence and provide the test results upon completion to the RPR for acceptance. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in

lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price subgrade preparation.

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. After compaction is completed, the subgrade area shall be proof rolled with a 20 ton (18.1 metric ton) Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 150 psi in the presence of the RPR. Apply a minimum of 95% 1 coverage, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D698 . The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698 .

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the methods in ASTM D698 .Tests for moisture content and compaction will be taken at a minimum of each day's production of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will

drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor’s expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

b. Grade. The grade and crown shall be measured on a 50-foot grid and shall be within +/- 0.05 feet of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP, and shall not be placed

on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 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. Stockpiling or removal off site of unclassified excavation shall be incidental to unclassified excavation.

152-3.2 The quantity of unsuitable excavation shall be paid for by the number of cubic yards measured in it 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. Unsuitable excavation shall be as defined in paragraph P-152-3.1.

152-3.3 Subgrade preparation shall be defined as preparing the finished grade of the earthwork prior to installation of the pavement section and surface courses. Any necessary unclassified excavation shall be measured and paid for under unclassified excavation. Any necessary embankment, and rough and finish grading necessary to reach subgrade elevation shall be included in the unit price for Subgrade Preparation.

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 furnishing all materials, labor, equipment, tools, hauling, and disposing of all materials, and incidentals necessary to complete the item.

152-4.2 Unsuitable excavation shall be made at the contract unit price per cubic yard. Payment shall be full compensation for excavation and for furnishing all materials, labor, equipment, tools, hauling, and disposing of all materials, and incidental necessary to complete the item.

152-4.3 Subgrade preparation shall be made at the contract unit price per square yard. This price shall be full compensation for compacting, shaping, and proof rolling the subgrade as specified above in P-152, and 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	Unsuitable Excavation – per cubic yard
Item P-152-3	Subgrade Preparation – 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.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2	Operational Safety on Airports During Construction Software

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66	Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

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Item P-153 Controlled Low-Strength Material (CLSM)

DESCRIPTION

153-1.1 This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the plans or as directed by the Resident Project Representative (RPR).

MATERIALS

153-2.1 Materials.

a. Cement. Cement shall conform to the requirements of ASTM C150 Type I, II or ASTM C595 IL.

b. Fly ash. Fly ash shall conform to ASTM C618, Class C or F.

c. Fine aggregate (sand). Fine aggregate shall conform to the requirements of ASTM C33 except for aggregate gradation. Any aggregate gradation which produces the specified performance characteristics of the CLSM and meets the following requirements, will be accepted.

Sieve Size	Percent Passing by weight
3/4 inch (19.0 mm)	100
No. 200 (75 µm)	0 - 12

d. 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.

MIX DESIGN

153-3.1 Proportions. The Contractor shall submit, to the RPR, a mix design including the proportions and source of aggregate, fly ash, cement, water, and approved admixtures. No CLSM mixture shall be produced for payment until the RPR has given written approval of the proportions. The proportions shall be prepared by a laboratory and shall remain in effect for the duration of the project. The proportions shall establish a single percentage or weight for aggregate, fly ash, cement, water, and any admixtures proposed. Laboratory costs are incidental to this item.

a. Compressive strength. CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi (690 to 1379 kPa) when tested in accordance with ASTM D4832, with no significant strength gain after 28 days.

b. Consistency. Design CLSM to achieve a consistency that will produce an approximate 8-inch (200 mm) diameter circular-type spread without segregation. CLSM consistency shall be determined per ASTM D6103.

CONSTRUCTION METHODS

153-4.1 Placement.

a. Placement. CLSM may be placed by any reasonable means from the mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed so structures or pipes are not displaced from their final position and intrusion of CLSM into unwanted areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed by the RPR. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one lift, the base lift shall be free of surface water and loose foreign material prior to placement of the next lift.

b. Contractor Quality Control. The Contractor shall collect all batch tickets to verify the CLSM delivered to the project conforms to the mix design. The Contractor shall verify daily that the CLSM is consistent with 153-3.1a and 153-3.1b. Adjustments shall be made as necessary to the proportions and materials as needed. The Contractor shall provide all batch tickets to the RPR.

c. Limitations of placement. CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least 35°F (2°C) and rising. Mixing and placement shall stop when the air temperature is 40°F (4°C) and falling or when the anticipated air or ground temperature will be 35°F (2°C) or less in the 24-hour period following proposed placement. At the time of placement, CLSM shall have a temperature of at least 40°F (4°C).

153-4.2 Curing and protection

a. Curing. The air in contact with the CLSM shall be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32°F (0°C), the material may be rejected by the RPR if damage to the material is observed.

b. Protection. The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi (105 kPa) is obtained. The Contractor shall be responsible for providing evidence to the RPR that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 153-3.1a.

153-4.3 Quality Assurance (QA) Acceptance. CLSM QA acceptance shall be based upon batch tickets provided by the Contractor to the RPR to confirm that the delivered material conforms to the mix design.

METHOD OF MEASUREMENT

153-5.1 Measurement.

No separate measurement for payment shall be made for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

153-6.1 Payment.

FAA AC 150/5370-10H

No payment will be made separately or directly for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

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 C33	Standard Specification for Concrete Aggregates
ASTM C150	Standard Specification for Portland Cement
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders
ASTM D6103	Flow Consistency of Controlled Low Strength Material (CLSM)

END OF ITEM P-153

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Item P-209 Crushed Aggregate Base Course

DESCRIPTION

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

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone, crushed gravel, and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 (4.75 mm) sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone, gravel, that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

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

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

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch (50 mm)	100		0
1-1/2 inch (37.5 mm)	95-100		±5
1 inch (25.0 mm)	70-95		±8
3/4 inch (19.0 mm)	55-85		±8
No. 4 (4.75 mm)	30-60		±8
No. 40[2] (425 µm)	10-30		±5
No. 200[2] (75 µm)	0-10		±3

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

[2] The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. 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 RPR, that the materials, equipment, and

construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches 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 base material delivered to the jobsite. The

laboratory specimens shall be compacted and tested in accordance with ASTM D698. The moisture content of the material during placing operations shall be within ±2 percentage points of the optimum moisture content as determined by ASTM D698. 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 inches, reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

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

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

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for this project. Sampling locations will be determined on a random basis per ASTM D3665

a. Density. The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance.

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D698. The in-place field density shall be determined per ASTM D1556. 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 using survey of the subgrade prior to P-209 placement and after compaction. The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall

correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade. 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 square yards of material actually constructed and accepted by the RPR as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

209-4.2 Separation geotextile Not Used.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per square yard for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-209-1	Crushed Aggregate Base Course (5-inch Depth) - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates

FAA AC 150/5370-10H

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

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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 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) 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	Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	ASTM D5821
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

Coarse Aggregate Material Requirements

Bulk density of slag [3]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	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	5% 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) 76-22.

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 Resident Project Representative (RPR) 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 RPR for review and accepted in writing. The RPR'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 RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR 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 RPR, will be borne by the Contractor.

The RPR 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 blows or 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.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows or gyrations	50	
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

[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

[3] Where APA not available , use Hamburg Wheel test (AASHTO T-324) 10mm @ 20,000 passes at 50°C.

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

	Gradation 2	Gradation 3
Sieve Size	**Percentage by Weight Passing Sieve**	**Percentage by Weight Passing Sieve**
1 inch (25.0 mm)	**--**	**--**
3/4 inch (19.0 mm)	**100**	**--**
1/2 inch (12.5 mm)	**90-100**	**100**
3/8 inch (9.5 mm)	**72-88**	**90-100**
No. 4 (4.75 mm)	**53-73**	**58-78**
No. 8 (2.36 mm)	**38-60**	**40-60**
No. 16 (1.18 mm)	**26-48**	**28-48**
No. 30 (600 µm)	**18-38**	**18-38**
No. 50 (300 µm)	**11-27**	**11-27**
No. 100 (150 µm)	**6-18**	**6-18**
No. 200 (75 µm)	**3-6**	**3-6**
Minimum Voids in Mineral Aggregate (VMA)[1]	**15.0**	**16.0**
Asphalt Percent:		
Stone or gravel	**5.0-7.5**	**5.5-8.0**
Slag	**6.5-9.5**	**7.0-10.5**
Recommended Minimum Construction Lift Thickness	**2 inch**	**1 1/2 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. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR**.** The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons or 1/2 sublot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F (71°C). The equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density greater than or equal to 94.5%, air voids 3.5% +/- 1%, and joint density greater than or equal to 92.5%.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

The control strip will be considered one lot for payment based upon the average of a minimum of 3 samples (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100.

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 RPR, 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 (7.5 cm) or greater	40 [1]	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	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 RPR, or RPR'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 RPR

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 RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). 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 RPR 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 (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

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 (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

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 RPR.

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 RPR 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 RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 12.5 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 RPR 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 RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, 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 RPR, 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 (3 m) 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 (80°C**)**; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) 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 Saw-cut grooving. Saw-cut grooving is not required.

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

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 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 RPR 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 RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR 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**.**

a. 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.

b. 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.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot straightedge approved by the RPR. 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 (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 feet or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch shall be corrected with diamond grinding per 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.

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

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the 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 RPR within 48 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 (12 mm) 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 RPR, 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 RPR 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 RPR 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 (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±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 (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	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 RPR 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.

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 (125 mm) 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 RPR.

(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 RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR 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 (6 mm) 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 RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) 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 RPR 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 (12 mm) vertically or 0.1 feet laterally.

Cross-sections of the pavement shall be taken at a minimum 25-foot longitudinal spacing, at all longitudinal grade breaks, and at start and end of each lane placed. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline, and edge of runway and taxiway 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 RPR. 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. The leveling course is the first variable thickness lift placed to correct surface irregularities prior to placement of subsequent courses. The leveling course shall meet the aggregate gradation in Table 2, paragraph 401-3.3. The leveling course shall meet the requirements of paragraph 401-3.3, 401-6.2b for air voids, but shall not be subject to the density requirements of paragraph 401-6.2b for mat density and 401-6.2c for joint density. The leveling course shall be compacted with the same effort used to achieve density of the control strip. The leveling course shall not exceed the lift thickness associated with each gradation in Table 2, paragraph 401-3.3.

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 RPR may decide to allow the rejected lot to remain. In that case, if the RPR 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 used**.**

401-8.1 Payment.

Payment will be made under:

Item P-401-1	Asphalt Surface Course (Gradation 2) - per ton
Item P-401-2	Asphalt Leveling Course (Gradation 3) - 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 D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM 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

FAA AC 150/5370-10H

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

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Item P-602 Emulsified Asphalt Prime Coat

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F or above, and the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

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 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, with a pressure range of 25 to 75 psi and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

602-4.1 The emulsified asphalt material for prime coat shall be measured by the gallon. Volume shall be corrected to the volume at 60°F 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

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Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F or above; the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven hundred (700) feet per minute.

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the

distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY	Emulsion Application Bar Rate, gal/SY
New asphalt	0.02-0.05	0.03-0.07
Existing asphalt	0.04-0.07	0.06-0.11
Milled Surface	0.04-0.08	.0.06-0.12
Concrete	0.03-0.05	0.05-0.08

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the gallon. Volume shall be corrected to the volume at 60°F in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per gallon of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-1	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

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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ASTM D6690.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F (3°C) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F (10°C) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, 14 days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not

be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed.

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

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. Hot-poured sealing equipment. The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by tractor-mounted routing equipment or concrete saw as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch ±1/16 inch (2 mm) below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 Joint sealing material shall be measured by the linear foot of sealant in place, completed, and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint sealing material shall be made at the contract unit price per linear foot. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-605-1	Joint Sealing Filler, per linear foot

REFERENCES

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

ASTM International (ASTM)

ASTM D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D5893	Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt]

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

Item P-606 Adhesive Compounds, Two-Component for Sealing Wire and Lights in Pavement

DESCRIPTION

606-1.1 This specification covers two types of material; a liquid suitable for sealing electrical wire in saw cuts in pavement and for sealing light fixtures or bases in pavement, and a paste suitable for embedding light fixtures in the pavement. Both types of material are two-component filled formulas with the characteristics specified in paragraph 606-2.4. Materials supplied for use with asphalt and/or concrete pavements must be formulated so they are compatible with the asphalt and/or concrete.

MATERIALS

606-2.1 Curing. When pre-warmed to 77°F (25°C), mixed, and placed in accordance with manufacturer's directions, the materials shall cure at temperatures of 45°F (7°C) or above without the application of external heat.

606-2.2 Storage. The adhesive components shall not be stored at temperatures over 86°F (30°C), unless otherwise specified by the manufacturer.

606-2.3 Caution. Installation and use shall be in accordance with the manufacturer's recommended procedures. Avoid prolonged or repeated contact with skin. In case of contact, wash with soap and flush with water. If taken internally, call doctor. Keep away from heat or flame. Avoid vapor. Use in well-ventilated areas. Keep in cool place. Keep away from children.

606-2.4 Characteristics. When mixed and cured in accordance with the manufacturer's directions, the materials shall have the following properties shown in Table 1.

Table 1. Property Requirements

Physical or Electrical Property	Minimum	Maximum	ASTM Method
Tensile			
Portland cement concrete	1,000 psi (70 kg/sq cm)		D 638
Asphalt concrete	500 psi (35 kg/sq cm)		
Elongation			
Portland cement concrete		See note [1]	D 638
Asphalt concrete	50%		D 638
Coef. of cub. exp. cu. cm/cu. cm/°C	0.00090	0.00120	D 1168
Coef. of lin. exp. cm/cm/°C	0.000030	0.000040	D 1168
Dielectric strength, short time test	350 volts/mil.		D 149
Arc resistance	125 sec		
Pull-off			
Adhesion to steel	1,000 psi (70 kg/sq cm)		
Adhesion to Portland cement concrete	200 psi (14 kg/sq cm)		
Adhesion to asphalt concrete	No test available.		
Adhesion to aluminum	250 psi		

[1] 20% or more (without filler) for formulations to be supplied for areas subject to freezing.

SAMPLING, INSPECTION, AND TEST PROCEDURES

606-3.1 Tensile properties. Tests for tensile strength and elongation shall be conducted in accordance with ASTM D638.

606-3.2 Expansion. Tests for coefficients of linear and cubical expansion shall be conducted in accordance with, Method B, except that mercury shall be used instead of glycerine. The test specimen shall be mixed in the proportions specified by the manufacturer, and cured in a glass tub approximately 2 inch (50 mm) long by 3/8 inch (9 mm) in diameter. The interior of the tube shall be precoated with a silicone mold release agent. The hardened sample shall be removed from the tube and aged at room temperature for one (1) week before conducting the test. The test temperature range shall be from 35°F (2°C) to 140°F (60°C).

606-3.3 Test for dielectric strength. Test for dielectric strength shall be conducted in accordance with ASTM D149 for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.4 Test for arc resistance. Test for arc resistance shall be conducted for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.5 Test for adhesion to steel. The ends of two smooth, clean, steel specimens of convenient size (1 inch by 1 inch by 6 inch) (25 mm by 25 mm by 150 mm) would be satisfactory when bonded together with adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure on a Riehle (or similar) tensile tester. The thickness of adhesive to be tested shall be 1/4 inch (6 mm).

606-3.6 Adhesion to Portland cement concrete

a. Concrete test block preparation. The aggregate grading shall be as shown in Table 2.

The coarse aggregate shall consist of crushed rock having a minimum of 75% of the particles with at least one fractured face and having a water absorption of not more than 1.5%. The fine aggregate shall consist of crushed sand manufactured from the same parent rock as the coarse aggregate. The concrete shall have a water-cement ratio of 5.5 gallons (21 liters) of water per bag of cement, a cement factor of 6, ±0.5, bags of cement per cubic yard (0.76 cubic meter) of concrete, and a slump of 2-1/2 inch (60 mm), ±1/2 inch (60 mm ±12 mm). The ratio of fine aggregate to total aggregate shall be approximately 40% by solid volume. The air content shall be 5.0%, ±0.5%, and it shall be obtained by the addition to the batch of an air-entraining admixture such as Vinsol® resin. The mold shall be of metal and shall be provided with a metal base plate.

Means shall be provided for securing the base plate to the mold. The assembled mold and base plate shall be watertight and shall be oiled with mineral oil before use. The inside measurement of the mold shall be such that several one inch (25 mm) by 2-inch (75 mm) by 3-inch (25 mm by 50 mm by 75 mm) test blocks can be cut from the specimen with a concrete saw having a diamond blade. The concrete shall be prepared and cured in accordance with ASTM C192.

Table 2. Aggregate for Bond Test Blocks

Type	Sieve Size	Percent Passing
Coarse Aggregate	3/4 inch (19.0 mm)	97 to 100
	1/2 inch (12.5 mm)	63 to 69
	3/8 inch (9.5 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine Aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 µm)	40 to 50
	No. 50 (300 µm)	16 to 26
	No. 100 (150 µm)	5 to 9

b. Bond test. Prior to use, oven-dry the test blocks to constant weight at a temperature of 220°F to 230°F (104°C to 110°C), cool to room temperature, 73.4°F ±3°F (23°C ±1.6°C), in a desiccator, and clean the surface of the blocks of film or powder by vigorous brushing with a stiff-bristled

fiber brush. Two test blocks shall be bonded together on the one inch by 3 inch (25 mm by 75 mm) sawed face with the adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure in a Riehle (or similar) tensile tester. The thickness of the adhesive to be tested shall be 1/4 inch (6 mm).

606-3.7 Compatibility with asphalt mix. Test for compatibility with asphalt in accordance with ASTM D5329.

606-3.8 Adhesive compounds - Contractor's responsibility. The Contractor shall furnish the vendor's certified test reports for each batch of material delivered to the project. The report shall certify that the material meets specification requirements and is suitable for use with concrete and/or asphalt concrete pavements. The report shall be provided to and accepted by the Resident Project Representative (RPR) before use of the material. In addition, the Contractor shall obtain a statement from the supplier or manufacturer that guarantees the material for one year. The supplier or manufacturer shall furnish evidence that the material has performed satisfactorily on other projects.

606-3.9 Application. Adhesive shall be applied on a dry, clean surface, free of grease, dust, and other loose particles. The method of mixing and application shall be in strict accordance with the manufacturer's recommendations. When used with Item P-605, such as light can installation, Item P-605 shall not be applied until the Item P-606 has fully cured.

METHOD OF MEASUREMENT

606-4.1 No separate measurement for payment shall be made for work under this specification.

BASIS OF PAYMENT

606-5.1 No separate payment shall be made for this item. Work under this specification shall be considered incidental to the airfield electrical installation.

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 C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D5329	Standard Test Methods for Sealants and Fillers, Hot-applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

END OF ITEM P-606

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Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking.

Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

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 C595 Type IL.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to

be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Not Used.

610-2.9 Joint filler. Not Used

610-2.10 Steel reinforcement. Reinforcing shall consist of Reinforcing Steel conforming to the requirements of ASTM A615**.**

610-2.11 Materials for curing concrete. Curing materials shall conform to ASTM C171.

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard. The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F nor more than 100°F. The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F, follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 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 RPR 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 RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 CONCRETE SHALL BE CONSIDERED INCIDENTAL TO THE ASSOCIATED ITEM AND NO SEPARATE MEASUREMENT SHALL BE MADE basis of payment.

BASIS OF PAYMENT

610-6.1 Payment shall include delivery and placement necessary to install concrete in place and accepted. It shall include labor, equipment, and materials. Concrete shall be incidental to the electrical pay item as indicated on the electrical plans.

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

FAA AC 150/5370-10H

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

FAA AC 150/5370-10H

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

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Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]					Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Temporary or Permanent**	**Type**	**Application Rate Minimum**
I	White	37925	115 ft^2/gal	Permanent	III	10 lb/gal
I	White	37925	230 ft^2/gal	Temporary	No beads	
III	White	37925	115 ft^2/gal	Permanent	III	8 lb/gal
I	Red	31136	115 ft^2/gal	Permanent	I	7 lb/gal
I	Red	31136	230 ft^2/gal	Temporary	No beads	
I	Yellow	33655	90 ft^2/gal	Permanent	III	10 lb/gal
I	Yellow	33655	230 ft^2/gal	Temporary	No beads	
I	Black	37038	115 ft^2/gal	Permanent	No beads	
I	Black	37038	230 ft^2/gal	Temporary	No beads	

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

a. Waterborne Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595. Refer to Table 1 for acceptable marking materials.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I or Type III, as specified. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis. The acrylic resin used for Type III shall be 100% cross linking acrylic as evidenced by infrared peaks at wavelengths 1568, 1624, and 1672 cm-l with intensities equal to those produced by an acrylic resin known to be 100% cross linking.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A and Type III, as specified. Glass beads for red and pink paint shall meet the requirements for Type I, Gradation A. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment. Glass beads shall not be used in black and green paint. Type III glass beads shall not be used in red and pink paint.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans. The locations of markings to receive silica sand shall be shown on the plans.

620-3.5 Application. A period of 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings. Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the

minimum levels of all readings which are within 30% of each other. Readings shall be taken twice per day.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux		
	White	**Yellow**	**Red**
Initial Type I	300	175	35
Initial Type III	600	300	35
All materials, remark when less than[1]	100	75	10

[1] 'Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a The quantity of surface preparation shall be measured by the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-4.1b The quantity of markings shall be paid for shall be measured by the number of square feet of painting.

620-4.1c The quantity of reflective media shall be paid for by the number of pounds of reflective media.

620-4.1d Temporary markings shall be incidental to the permanent marking of equivalent color and position, performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.1a Payment for surface preparation shall be made at the contract price for the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-5.2b Payment for markings shall be made at the contract price for the by the number of square feet of painting.

620-5.3c Payment for reflective media shall be made at the contract unit price for the number of pounds of reflective media.

620-5.4d Payment for temporary markings shall be incidental to the permanent marking of equivalent color and position. This includes full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-1	Surface Preparation per square foot
Item P-620-2	White Reflective Marking (Type 1 Waterborne Paint) per square foot
Item P-620-3	White Reflective Marking (Type III Waterborne Paint) per square foot
Item P-620-4	Yellow Reflective Marking (Type I Waterborne Paint) per square foot
Item P-620-5	Red Reflective Marking (Type I Waterborne Paint) per square foot
Item P-620-6	Black Non-Reflective Marking (Type 1 Waterborne Paint) per square foot
Item P-620-7	Reflective Media (Type I Glass Beads, Gradation A) per pound
Item P-620-8	Reflective Media (Type III Glass Beads) per pound

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

FAA AC 150/5370-10H

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

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Item D-701 Pipe for Storm Drains and Culverts

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

701-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements:

American Association of State Highway and Transportation Officials (AASHTO) M167	Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M243	Standard Specification for Field-Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains

701-2.3 Concrete. Not used.

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

701-2.5 Joint mortar. Not used.

701-2.6 Joint fillers. Not used.

701-2.7 Plastic gaskets. Not used.

701-2.8. Controlled low-strength material (CLSM). Not used.

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or American Concrete Pipe Association QCast Plant Certification program.

CONSTRUCTION METHODS

701-3.1 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 12 inches (300 mm) on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch (200 mm) or 1/2 inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform foundation.

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

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

701-3.2 Bedding. The bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

a. Rigid pipe. The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed uncompacted material under the middle third of the pipe prior to placement of the pipe.

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

Flexible Pipe Bedding

Pipe Corrugation Depth		Minimum Bedding Depth	
inch	**mm**	**inch**	**mm**
1/2	12	1	25
1	25	2	50
2	50	3	75
2-1/2	60	3-1/2	90

c. Other pipe materials. For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches (19 mm). For pipes installed under paved areas, no more than 12% of the material shall pass the No. 200 (0.075 mm) sieve. For all other areas, no more than 50% of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) below the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

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

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

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

701-3.4 Joining pipe. Not Used.

a. Concrete pipe. Not Used.

b. Metal pipe. Metal pipe shall be firmly joined by form-fitting bands conforming to the requirements of ASTM A760 for steel pipe and AASHTO M196 for aluminum pipe.

c. PVC, Polyethylene, or Polypropylene pipe. Not Used.

d. Fiberglass pipe. Not Used.

701-3.5 Embedment and Overfill. Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

701-3.5-1 Embedment Material Requirements

a. Concrete Pipe. Not Used.

b. Plastic and fiberglass Pipe. Not Used.

c. Metal Pipe. Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Thoroughly compact the embedment material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

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

701-3.6 Overfill

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be place and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D698**.** The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

701-3.7 Inspection Requirements

An initial post installation inspection shall be performed by the RPR no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition. The video image shall be clear, focused, and relatively free from roll, static, or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe.

Incorporate specific inspection requirements for the various types of pipes beneath the general inspection requirements.

Determine whether the allowable deflection has been exceeded by use of a laser profiler for internal pipe diameters of 48 inches or less, or direct measurement for internal pipe diameters greater than 48 inches. Laser profile equipment shall utilize low barrel distortion video equipment. Deflection of installed pipe shall not exceed the limits provided in the table below, as a percentage of the average inside diameter of the pipe.

Maximum Allowable Pipe Deflection

Type of Pipe	**Maximum Allowable Deflection (%)**
Corrugated Metal Pipe	5
Concrete Lined CMP	3
Thermoplastic Pipe	5
Fiberglass	5

If deflection readings in excess of the allowable deflection are obtained, remove the pipe with excessive deflection and replace with new pipe. Isolated areas may exceed allowable by 2.5% with concurrence of RPR. Repair or replace any pipe with cracks exhibiting displacement across the crack, bulges, creases, tears, spalls, or delaminations. The report for flexible pipe shall include as a minimum, the deflection results and final post installation inspection report. The inspection report shall include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design line and grade, and inspector's notes.

METHOD OF MEASUREMENT

701-4.1 The length of pipe shall be measured in linear feet (m) of pipe in place, completed, and accepted. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The 18-inch Corrugated Metal Pipe shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

701-4.2. Not used.

701-4.3 Not used.

701-4.4 The volume of rock, hardpan, or other unyielding required to install CMP pipe shall be incidental in material, labor, and installation of the pipe pay item. No payment shall be made for the cushion material placed for the bed of the pipe.

BASIS OF PAYMENT

701-5.0 These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

701-5.1 Payment will be made at the contract unit price per linear foot (meter) for 18-Inch Corrugated Metal Pipe.

701-5.2 Not used.

701-5.3 Not used.

701-5.4 Not used.

Payment will be made under:

Item 701-1	18-Inch Corrugated Metal Pipe per linear foot

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M167	Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M190	Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M219	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M243	Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter

ASTM International (ASTM)

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A761	Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains

ASTM A849	Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM D1056	Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

FAA AC 150/5370-10H

ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2435	Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

National Fire Protection Association (NFPA)

NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways

END ITEM D-701

Item T-901 Seeding

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding, fertilizer, and liming in the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 Seed. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Seed Properties and Rate of Application

Seed	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application lb/acre
Application Between March 15 – September 15			
*Bermuda (Hulled)	90%	-	50 lb/ac
Tall Fescue (K-31)	98%	-	100 lb/ac
Application Between September 15 – March 15			
*Bermuda (Unhulled)	90%	-	55 lb/ac
Tall Fescue (K-31)	98%	-	100 lb/ac

Millet and Bahia seed is expressly prohibited from being applied anywhere on the project. Should the contractor apply Millet and Bahia knowingly or unknowingly to the project, an initial fine of $1,000.00 will be levied. An additional $1,000.00 per day shall be levied on the Contractor for each day the Millet and Bahia seed is not removed from the project. The fines levied shall be

recorded daily and shall be deducted from the Contractor's earnings at the end of the project. The Contractor shall submit a certification of the seed provided for this project stating no Millet or Bahia is present in the seed.

901-2.2 Lime. Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 (850 μm) mesh sieve and 50% will pass through a No. 100 (150 μm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of **2 tons per 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 10-10-10 commercial fertilizer and shall be spread at the rate of 1000 pounds per acre.

901-2.4 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

901-3.1 Advance preparation and cleanup. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of

soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 Dry application method.

a. Liming. Not required.

b. Fertilizing. Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

901-3.3 Wet application method.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve

connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. The Contractor shall identify to the RPR all sources of water at least two (2) weeks prior to use. The RPR may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the RPR following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the RPR, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 Maintenance of seeded areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the RPR. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the RPR. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

METHOD OF MEASUREMENT

901-4.1 The quantity of seeding to be paid for shall be the number of units per 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 (including lime and fertilizer) 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	Seeding - per acre

REFERENCES

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

ASTM International (ASTM)

ASTM C602	Standard Specification for Agricultural Liming Materials

Federal Specifications (FED SPEC)

FED SPEC	JJJ-S-181, Federal Specification, Seeds, Agricultural

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-901

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Item T-904 Sodding

DESCRIPTION

904-1.1 This item shall consist of furnishing, hauling, and placing approved live sod on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

904-2.1 Sod. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials that might be detrimental to the development of the sod or to future maintenance. At least 70% of the plants in the cut sod shall be composed of the species stated in the special provisions, and any vegetation more than 6 inches (150 mm) in height shall be mowed to a height of 3 inches (75 mm) or less before sod is lifted. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than that stated in the special provisions.

904-2.2 Lime. Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 (850 µm) mesh sieve and 50% will pass through a No. 100 (150 µm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of **2 tons per acre**. All liming materials shall conform to the requirements of ASTM C602.

904-2.3 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 10-10-10 commercial fertilizer and shall be spread at the rate of 1000 lb/ac.

904-2.4 Water. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass.

904-2.5 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

904-3.1 General. Areas to be solid, strip, or spot sodded shall be shown on the plans. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition that are to remain undisturbed shall also be shown on the plans.

Suitable equipment necessary for proper preparation of the ground surface and for the handling and placing of all required materials shall be on hand, in good condition, and shall be approved by the RPR before the various operations are started. The Contractor shall demonstrate to the RPR before starting the various operations that the application of required materials will be made at the specified rates.

904-3.2 Preparing the ground surface. After grading of areas has been completed and before applying fertilizer and limestone, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

904-3.3 Applying fertilizer and ground limestone. Following ground surface preparation, fertilizer shall be uniformly spread at a rate which will provide not less than the minimum quantity of each fertilizer ingredient, as stated in the special provisions. If use of ground limestone is required, it shall then be spread at a rate that will provide not less than the minimum quantity stated in the special provisions. These materials shall be incorporated into the soil to a depth of not less than 2 inches (50 mm) by discing, raking, or other suitable methods. Any stones larger than 2 inches (50 mm) in any diameter, large clods, roots, and other litter brought to the surface by this operation shall be removed.

904-3.4 Obtaining and delivering sod. After inspection and approval of the source of sod by the RPR, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches (50 mm). Sod sections or strips shall be cut in uniform widths, not less than 10 inches (250 mm), and in lengths of not less than 18 inches (0.5 m), but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

The sod shall be transplanted within 24 hours from the time it is stripped, unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, approval to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

904-3.5 Laying sod. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the RPR, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches (100 mm) immediately prior to laying the sod.

The sod shall be moist and shall be placed on a moist earth bed. Pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface, and ensure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen, when replacing it, shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately one inch (25 mm) below the pavement edge. Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with pavement edges.

On slopes steeper than one (1) vertical to 2-1/2 horizontal and in v-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches (300 mm) in length and have a cross-sectional area of not less than 3/4 sq inch (18 sq mm). The pegs shall be driven flush with the surface of the sod.

904-3.6 Watering. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner that will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.

904-3.7 Establishing turf. The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the RPR. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. Weeds or other undesirable vegetation shall be mowed and the clippings raked and removed from the area.

904-3.8 Repairing. When the surface has become gullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the

condition of the soil, as directed by the RPR, and shall then be sodded as specified in paragraph 904-3.5.

METHOD OF MEASUREMENT

904-4.1 This item shall be measured on the basis of the area in square yards of the surface covered with sod and accepted. All fertilizer and lime associated with installation of Sodding shall be incidental to the Sodding pay item. This includes the material, installation, and labor associated with Sodd installation.

BASIS OF PAYMENT

904-5.1 This item will be paid for on the basis of the contract unit price per square yard for sodding, which price shall be full compensation for all labor, equipment, material (including lime and fertilizer), staking, and incidentals necessary to satisfactorily complete the items as specified.

Payment will be made under:

Item T-904-1	Sodding - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM C602 Standard Specification for Agricultural Liming Materials

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-904

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 (75 μm) sieve as determined by the wash test in accordance with ASTM C117.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

905-2.2 Inspection and tests. Within 10 days following acceptance of the bid, the RPR shall be notified of the source of topsoil to be furnished by the Contractor. The topsoil shall be inspected to determine if the selected soil meets the requirements specified and to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths, for testing purposes as specified in paragraph 905-2.1.

CONSTRUCTION METHODS

905-3.1 General. Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the RPR before the various operations are started.

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

905-3.3 Obtaining topsoil. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the RPR. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site, the Contractor shall remove this material from the designated areas and to the depth as directed by the RPR. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the RPR. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoil purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the RPR. The Contractor shall notify the RPR sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.

905-3.4 Placing topsoil. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 2 inches 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.

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.

Payment will be made under:

Item T-905-1	Topsoil Obtained on 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 mm (No. 200) Sieve in Mineral Aggregates by Washing

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-905

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Item T-908 Mulching

DESCRIPTION

908-1.1 This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the RPR.

MATERIALS

908-2.1 Mulch material. Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

a. Manufactured mulch. Cellulose-fiber or wood-pulp mulch shall be products commercially available for use in spray applications.

b. Asphalt binder. Asphalt binder material shall conform to the requirements of ASTM D977, Type SS-1 or RS-1.

908-2.2 Inspection. The RPR shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the RPR and any materials brought on the site that do not meet these standards shall be rejected.

CONSTRUCTION METHODS

908-3.1 Mulching. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the RPR. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre 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 RPR. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches 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 RPR. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the "peg and string" method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

908-3.3 Care and repair.

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the RPR, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the RPR, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the "asphalt spray" method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons per 1,000 square feet, or as directed by the RPR, 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 RPR, 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 Mulching shall be measured in square yards on the basis of the actual surface area acceptably mulched.

BASIS OF PAYMENT

908-5.1 Payment will be made at the contract unit price per square yard for mulching. The price shall be full compensation for furnishing all materials and for placing and anchoring the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-908-1	Mulching - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM D977	Standard Specification for Emulsified Asphalt

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-908

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Item L-100
General Provisions and Requirements for Electrical Work

DESCRIPTION

100-1.1 Special Requirements for Electrical Work. These special requirements apply for the electrical work. Where the contract special conditions or general provisions also apply, the stricter of the documents will apply, and the RPR must immediately be notified.

100-1.2 Auxiliaries and Accessories. Include all auxiliaries and accessories for a complete and properly operating system, to the satisfaction of the RPR.

Provide and install all electrical systems and any necessary appurtenances as per FAA Advisory Circulars, NEC and local codes whether specified or shown on drawings or not. The content of these specifications and contract documents in general only refers to work required above and beyond the requirements of the NEC and applicable local codes.

100-1.3 Project Pay Items. The project pay items are provided to be inclusive of all work to be performed as shown in the contract documents. All work not identified with a specific pay item is to be considered work to complete the project and is to be subsidiary to the cost of project pay items provided.

SUMMARY OF WORK

100-2.1 Supervision and Attendance. The Contractor must provide a resident field superintendent who has a minimum of four years previous successful experience on projects of comparable sizes and complexity. The Superintendent must be present at all times that work under this division is being installed or affected.

100-2.2 Record Documents. The Contractor must maintain the contract documents, shop drawings and samples at the site, in good order and annotated daily to show all changes made during the construction process. These must be available to the RPR for examination.

100-2.3 Safety and Protection. The Contractor is solely and completely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. The Contractor must take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to:

a. All employees on the work and other persons (including but not limited to the general public) who may be affected thereby,

b. All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and

c. All other property at the site, adjacent thereto, or utilized by the Contractor including but not limited to trees, shrubs, lawns, walks, pavements, structures, building, roadways, civil structures, electrical equipment, underground facilities, and other utilities not designated for removal, relocation or replacement in the course of construction regardless of whether or not such

other property is indicated in the Contract Documents.

d. Existing underground utilities and systems both shown on the plans and those not shown. The Contractor must have all utilities and systems field located by the FAA or appropriate authorities having jurisdiction and must take whatever measures necessary to protect the utilities and systems from damage.

The Contractor must comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss.

All hoisting machinery must be inspected by a competent person or by a government or private agency recognized by the U.S. Department of Labor. A copy of the written inspection report must be submitted to the RPR prior to the start of work requiring the use of this equipment.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor must follow work schedules established in the plans and specifications or as directed by the RPR. The system must be installed in accordance with the National Electrical Code and/or local code requirements.

The Contractor must provide temporary wiring as required to reconnect existing circuits to provide guidance for aircraft to pass through the construction areas on those taxiways/runways which must remain open. The Contractor must check all temporary circuits before dark each day to assure that they are operational. In the event of failure, the Contractor must immediately notify the RPR and immediately take steps to restore operation.

Powder-actuated fasteners will not be allowed without express written approval of the RPR. No fasteners will pierce the structure until approved by the RPR.

Clean up of scrap materials and waste of the Contractor to be completed daily or more frequently as needed.

100-2.4 Engineering Inspections. Items noted by the Owner, or their authorized representative during construction and before final acceptance which do not comply with the contract documents will be listed in accordance with the specifications. These items will be sent to the Contractor for action. The Contractor must have these items corrected.

Items noted after acceptance during the warranty period will be checked and corrected by the Contractor in a timely manner acceptable to the RPR.

100-2.5 Existing Conditions. Investigate the construction site thoroughly and reroute all conduit and wiring in area of new construction in order to maintain continuity of existing circuitry. Existing conduit shown on plans show approximate locations only. The Contractor must verify and coordinate existing site utilities, conduits and piping. The specifications include hand digging within five (5) feet of all existing utilities and all required rerouting in areas of existing utilities, conduits and/or pipes.

The Contractor must check the construction site and existing conditions thoroughly within 5-days

of Notice-To-Proceed. The Contractor will advise the RPR of discrepancies or questions noted.

Special attention is called to the fact that work involved in this project is in connection with existing systems/facilities which must remain in operation while work is being performed. Work must be done in accordance with the schedule specified in the contract documents. Schedule work for a minimum outage to the Owner. Request written permission and receive written approval from the Owner/RPR a minimum of 72 hours in advance of any shut-down of existing systems. Perform work required at other than standard working hours where outages cannot be approved during regular working hours. Protect all existing facilities during construction as required.

Special attention is called to the fact that there may be piping, fixtures or other items in the existing systems which must be removed or relocated in order to perform the alteration work. All conduit, wiring, boxes, etc. that do not comply with these specifications must be removed or corrected to comply with these specifications. All unused conduit not removed must be identified and a pull line must be installed. Bid must include all removal and relocation required for completion of the alterations and the new construction.

If any difference is discovered between the existing conditions and the drawings or specifications, the RPR must be notified in writing immediately.

100-2.6 Systems Guarantee. The work required under this specification must include a one (1) year warranty unless required otherwise by these specifications. This warranty will be by the Contractor to the Owner for any defective workmanship or material which has been furnished under this contract for a period of one year (1) from the date of final acceptance of the system.

100-2.7 Substantial Completion. All specified work must be complete prior to final inspection of the work, and all forms and other information requested, including maintenance manuals, must be submitted to the RPR for approval one (1) week before the request for substantial completion of the work.

100-2.8 Final Acceptance. All work specified must be complete after the substantial completion observation, all repairs made, and all required information approved at which time the Owner will formally accept the project and take possession of all work on a permanent basis.

100-2.9 Contractors Responsibilities. Provide necessary layout, labor, material, equipment, tools, transportation, full time supervision and services required for the satisfactory and timely completion of the work in accordance with the drawings and specifications and contract documents.

Unload, store, protect and re-handle the materials required for this contract until such time that material is in place. Provide protection of materials required of this contract after installation.

Provide all required transportation, erection, maintenance, dismantling and removal of temporary facilities and equipment required by this contract.

Provide all transportation, unloading, distribution, hoisting, rigging, material handling and scaffolding required to install the work of this contract.

Provide all engineering and layout required to perform the work.

Provide temporary electrical power and temporary water and sanitary sewer for the Contractor's field office, Engineer's field office and on-site testing laboratory. Pay all utility company charges. Provide temporary power required for the Contractor's work.

Prior to start of his work the Contractor is to inspect work performed by others on which this work is to be placed on or adjacent to, and report in writing to the RPR, any condition found to be unacceptable. Failure to make said report will constitute acceptance of the conditions found and any claims made thereafter due to the unacceptable conditions will not be considered by the RPR.

Provide all required coordination and supervision where work connects to or is affected by work of others, and comply with all requirements affecting this work. Work required under other sections, specifications or drawings to be performed by this section must be coordinated with the respective contractor, and such work performed at no additional cost to the Owner including but not limited to electrical work in support of the mechanical division of the specifications and drawings.

It is the responsibility of the Contractor to coordinate the exact required location of any electrical or electronic equipment, system, or cabinets to be installed in or relocated inside an existing electrical or electronic equipment space. No existing equipment may be relocated in any existing electrical or electronic equipment room without prior coordination and with written approval of the RPR.

Provide and pay for all permits, licenses, fees and inspections required for the performance of the work. The Contractor must pay all sales, consumer use, and other taxes required to be paid in accordance with the laws of the place of the project.

Provide all tests as required, per the drawings and specifications and submit all test reports to the RPR.

Provide all excavation, backfill, compaction, shoring and dewatering required for performance of the work.

Provide sleeves for all conduit required as specified.

Protect all work of this contract from damage and intrusion of dirt and foreign objects. Close off open ends of conduit and sleeves on work which is to be completed at a later date. Remove closure material prior to continuance of work.

Prior to Final Inspection, submit to the RPR, all Record Drawings and Operation and Maintenance Manuals as specified. Instruct the Airport's maintenance personnel in the operation and maintenance of the systems as required by the Specifications.

The above is not all inclusive of the work described by the drawings and Specifications, which form the basis for this contract, but is presented for the Contractor's convenience.

100-2.10 Interpretation of Drawings and Specifications. Should the Contractor have any

questions during constructions, the Contractor must secure written instructions from the RPR before proceeding with the work affected thereby; otherwise the Contractor will be deemed to be proceeding at his own risk and expense. It is understood and agreed that the work will be performed according to the true intent of the contract documents. By successfully bidding the project, the Contractor confirm the plans are constructible except for differing field conditions. The Contractor may turn in a request for information if needed.

100-2.11 Interpretation of Drawings and Specifications. Should the requirements in the plans and/or specifications appear to be in conflict, the Contractor's bid shall include the more costly requirement which includes labor and material cost.

BASIC MATERIAL & METHODS

100-3.1 Requirements of Basic Materials and Methods. The work must include the furnishing of the systems, equipment and material specified in these specifications and as called for on the drawings, to include: supervision, operations, methods and labor for the fabrication, installation, start-up and tests for the complete electrical installation. Provide the necessary intertrade/Contractor coordination for the installation to be in a neat and workman like manner.

Drawings for the work are diagrammatic, intended to convey the scope of the work and to indicate the general arrangement and locations of the work. The drawings must not be scaled for exact sizes or locations. Because of the scale of the drawings, certain basic items such as: conduit fittings, access panels, sleeves, pull and junction boxes may not be shown. Where such items are required by Code or by other sections or where they are required for proper installation of the work, such items must be included. Coordinate final equipment locations with governing architectural and structural drawings. Layout equipment before installation so that all trades may install equipment in the space available.

Equipment Specifications may not deal with minute items such as components, parts, controls and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they must be included by the Contractor or the supplier of the equipment, whether or not specifically called for.

Conduit that interferes with other equipment and construction will not constitute a reason for an extra charge. Equipment, conduit, and fixtures must fit into available spaces in the building and on the airfield. Equipment that requires servicing must be readily accessible.

Locate all openings required for work performed under this section. Provide sleeves, guards or other approved methods to allow passage of items installed under this section.

Keep cutting and patching to a minimum. Insofar as possible, determine in advance the proper chase size and openings necessary for the work.

Where cutting and patching are required due to an error of the Contractor, or where the Contractor has not given enough advance notice of the need for holes, recesses, and chases, patching must be performed by those trades skilled in the use of the materials involved and will be done at the Contractor's expense.

Any cutting of work in place must be patched and decorated by such mechanics and in such a manner that the quality of workmanship and finish must be compatible with that of adjacent construction.

The basis for new design requires that electrical services, switchgear, panelboard and transformers total calculated connected load not be more than 60% of the service size. The total calculated load requirements for alterations may not be more than 80%.

Wall penetrations are to be waterproofed. Floor penetrations must be sealed with fire proof sealant to prevent water from leaking to floor below and to provide a 3 hour fire and smoke barrier. Wall penetrations must be sealed to provide a 3 hour rated fire seal.

All materials utilized must be suitable for the environment encountered. No combination of materials can be used that forms an electrolytic coupling of such nature that in the presence of moisture corrosion is accelerated.

In general, all relays, contactors, starters, motor control centers, switchboards, panelboards, dry type transformers, disconnect switches, circuit breakers, and manual motor starter switches are to be supplied and manufactured by the same manufacturer and will be submitted and approved as equal to that specified.

Make electrical connections to constant current regulators, transformers, motors, instruments, mechanical equipment, controls and at other locations as required with approximately 3 feet (12" minimum) of Sealtight flexible conduit. The sealtight electrical conduit will utilize strain relief type connectors by adding a T&B wire mesh grip, WMG-LT series, or approval equal to each sealtight connector. Determine the requirements from drawings, these specifications, and the approved manufacturer drawings.

Provide inserts, hangers, supports, braces, and anchor bolts as necessary for all work called for under these specifications.

All conduits must contain one copper grounding conductor, in accordance with NFPA 70, NEC Article 250. #6 AWG and smaller must have green insulation. #4 AWG and larger must have black insulation with green phasing tape. The only exception is the 5KV airfield lighting conduits and duct banks.

All galvanized materials must be hot-dip galvanized after fabrication, conforming to ASTM A 123 and/or A 153, unless noted otherwise.

Unless noted otherwise, all panelboards, motor starters, junction boxes, wireways, etc., will be spaced off the concrete structure by using a Unistrut P-1060 series square washer or approved equal between the mounting surface and the equipment at each mounting point. Equipment as listed above, mounted on Unistrut or approved equal must have Unistrut P-1060 series square washer or approved equal installed between the Unistrut channel or approved equal and the equipment at each mounting point. All bolted connections and equipment mountings will utilize a flat washer, lock washer and hex head A-325 bolting hardware.

Unless noted otherwise, all wire sizes are based on a 135 degrees F (75 degrees C), XHHW 600

volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit sizes are based on the use of XHHW 600 volt insulated conductors. The Contractor must make the necessary increase in conduit sizes for other types of wire insulation. In no case will the conduit size be reduced. The minimum wire size will be #12 AWG.

All electrical conductors, windings, busbars, etc. will be high conductivity (98% conductivity) copper.

The Contractor must furnish and install all required motor overcurrent protection required by the NEC and these drawings and specifications. The overcurrent protection must be sized according to the motor nameplate data.

100-3.2 Electrical Reference Symbols. Symbols used on the plans are defined in the Electrical Legend on the Drawings. Not necessarily will all symbols scheduled be applicable to the project.

100-3.3 Active Services. Existing active services i.e., water, gas, sewer, electric, communications, etc. when encountered, must be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, the Contractor will make a written request to the RPR for determination of procedures. Where existing services are to be abandoned, they must be terminated in conformance with requirements of the Utility or Municipality or Authority having jurisdiction.

100-3.4 Codes and Fees. Install in accordance with latest edition of FAA Advisory Circulars, the National Electrical Code and the regulations of governing Federal, State, County, local and other applicable codes, including the Utilities Company. Where a conflict in code requirements occurs the most stringent requirement will govern. The Contractor will be responsible and pay all required licenses, fees and inspections including meter installation fee. The cost for such must be included in the bid price.

The work must meet the requirements and recommendations of applicable portions of the latest editions of these standards:

a. National Electrical Code (NFPA 70)

b. Life Safety Code (NFPA 101)

c. National Electrical Safety Code (ANSI C2)

d. NEMA Standards (NEMA)

e. Underwriter's Laboratories (UL)

f. Institute of Electrical and Electronics Engineers (IEEE)

g. Lightning Protection Code (NFPA) 780 and UL 96A)

h. AWS D1.1

i. ANSI

j. NFPA

k. Federal Aviation Administration Advisory Circulars (AC)

l. Applicable Local Building Code

m. Certified Ballast Manufacturers (CBM)

The above is not all inclusive of applicable codes and standards but is presented for the Contractors convenience.

100-3.5 Standards. All materials must be new and free of defects and must be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data will be submitted to prove to the RPR that equipment meets or exceeds available standards. All listed, labeled or approved material must be used only for the intended purpose.

100-3.6 Utility Company Fees, Charges, Costs. It is the Contractor's responsibility to contact the applicable Utility Company(s) to determine if any fees, charges or costs will be due the Utility Company(s) as required by the Utility Company(s) for temporary power or new services, installations, hook-ups, etc. The associated fee, charge or cost for each utility must be included in the Contractor's bid price.

100-3.7 Tests. Systems must be tested by the Contractor and placed in proper working order prior to demonstrating systems to the RPR. Refer to the requirements in each section for other applicable standards.

After work is completed a load balance test must be made, as required, to demonstrate that with full lighting and mechanical load the balance between phases is within 5%. Unbalance beyond this limit must be corrected.

System ground and lightning protection system ground must be tested, as required, to demonstrate that the ground resistance does not exceed twenty-five (25) ohms per ground rod. All testing must be done by methods approved by the RPR and prior to the connection of the grounding conductors.

Perform such tests as required by any Authorities having jurisdiction over the site. Refer to specification L-131, Demonstrations, Tests and Performance Verification.

Testing methods must be acceptable to the RPR and must be submitted to the RPR for review, a minimum of thirty (30) days prior to the scheduled test.

IDENTIFICATION

100-3.8 Laminated Phenolic Plastic Nameplates. The Contractor must provide nameplates for wiring systems and equipment as called for herein. All nameplates must have beveled edges and one-half inch (1/2") lettering. If equipment is smaller than ten inches by six inches (10"x 6"),

one-quarter inch (1/4") lettering may be used. Smaller lettering may be used with permission of the RPR in writing.

Nameplates must be laminated phenolic plastic, black front and back with white core, with lettering etched through the outer covering. White engraved letters on black background. Emergency systems must use red front and back with white core for nameplates. Attach nameplates with 4-40 stainless steel self tapping screws. Where conditions do not warrant piercing the enclosure "LOCTITE" brand adhesive or approved equal may be used with permission of the RPR for all NEM3R and 4X enclosures.

The following items must be equipped with nameplates: all constant current regulators, pushbutton stations, control panels, system cabinets, terminal cabinets, disconnect switches, panelboards, circuit breakers, contactors or relays in separate enclosures, high voltage boxes and cabinets whether existing or planned by these specifications. Special electrical systems must be identified at junction and pull boxes, terminal cabinets and equipment racks. Junction boxes must comply with paragraph 100-3.10, Junction/Pull Box Color Code.

Nameplates must adequately describe the function of the particular equipment involved. Where nameplates are detailed on the drawings, inscription and size of letters must be as shown and shop drawing submitted for approval. Nameplates for panelboards and switchboards must include the panel designation, panel name, circuit designation source of power and voltage and phase of the supply. For example, "Equip YY, Panel A, CKT XX fed from Panel XYZ, 480/277V, 3-phase, 4-wire." The name of the machine on the nameplates for a particular machine must be the same as the one used on all motor starters, disconnects and pull box station nameplates for that machine. Nameplates must include as a minimum the following:

a. Equipment Number

b. Equipment Name

c. Power Source w/Circuit Designation

d. Voltage Level and number of phases

All major pull and junction boxes in service areas, tunnels, above accessible ceilings and in accessible chases must have nameplates identifying the feeder or system.

Systems with conductors exceeding 100 volts to ground must have voltage identification nameplates with one-half inch (1/2") high letters on all panels, switches, pull boxes and junction boxes.

100-3.9 Adhesive Backed Cloth Markers. All raceways containing conductors exceeding 150 volts to ground must have adhesive backed cloth/vinyl markers installed at each end and every thirty feet (30') in between identifying the voltage level (Example: "480 VOLTS"). If the conduit is less than ten feet (10') in length one marker is acceptable. The markers must be installed so they are visible from floors and walkways. Normal power system must use black letters, emergency systems must use red letters.

The markers must be "Brady" brand or approved equal with one-half inch (1/2") letters.

The markers must be suitable for the environmental conditions encountered.

100-3.10 Junction/Pull Box Color Code. Circuit numbers and circuit identification must be printed on junction box and pull box covers using ink markers and must be plainly visible after paint is applied. The entire box and cover must be color coded as listed below:

Color Code for Junction Boxes	Krylon Color & Paint # Or Approved Equal	
Normal Power 480/277 Volt	Brown	2501-6
Normal Power 208/120 Volt	Black	1601-6

100-3.11 Concrete Work. Concrete bases and pads for all equipment furnished by the Contractor must be the responsibility of the Contractor unless noted otherwise.

The Contractor must furnish all equipment anchor bolts and will be responsible for their proper installation and accurate location.

100-3.12 Excavating, Trenching And Backfilling. The Contractor will do excavating necessary for light bases, underground wiring, conduit and ductbanks and must backfill trenches and excavations after work has been inspected. Care must be taken in excavating that walls and footings and adjacent load bearing soils are not disturbed in any way, except where lines must cross under a wall footing. Where a line must pass under a footing, the crossing must be made by the smallest possible trench to accommodate the conduit. Excavations must be kept free from water. No greater length of trench may be left open in advance of conduit laying than that which is authorized or directed by the RPR.

Roots must be removed to a level of eighteen (18") below furnished grades and deeper as required for duct runs, manholes and light pole bases. No roots will be allowed to remain under the work.

Backfill about the structures will be placed, where practical, as the work of construction progresses. Backfilling on or against concrete work must be done only when directed. Backfilling of duct lines will progress as rapidly as the testing and acceptance of the finished sections of the work will permit and must be carried to a crown approximately six inches (6") above the existing grades. In backfilling around duct lines, selected material must be compacted firmly around the duct. Fill and backfill must be clean and free from vegetable matter and refuse.

All trenches and other excavation left open by necessity must be barricaded and guarded as required by OSHA or applicable codes and regulations.

100-3.13 Welding. All welding and weld procedures must be in accordance with AWS D1.1, Latest Edition. Qualifications of welders and welding operators must be in accordance with AWS D1.1, Latest Edition. The welder qualification test must be performed on a 1" A-36 Test Coupon in the 3G and 4G positions. The welder qualification must be current within 12 months of the work being performed. Weld inspections must be per the criteria set forth in AWS D1.1 for visual weld inspection.

DESIGNATION OF MATERIALS

100-4.1 Criterion Designation Of Materials And Equipment. Where a criterion specification is designated for any material or equipment to be installed by the name or catalog number of one specific manufacturer, such designation is intended only for the purpose of establishing the style, quality, performance characteristics, etc., and is not intended to limit acceptability of competitive products. Products of other manufacturers which are approved by the Engineer as similar and equal will be equally acceptable unless specifically otherwise stated.

Where equipment or materials are specified by the use of the name and catalog number of more than one manufacturer, that equipment or material must be one of those specified. No alternative will be acceptable.

Where no brand name is specified, the source and quality will be subject to the Engineer's review and acceptance.

When a product is specified to be in accordance with a trade association or government standard, at the request of the RPR, the Contractor will furnish a certificate that the product complies with the referenced standard. Upon request of the RPR, the Contractor must submit supporting test data to substantiate compliance.

The Engineer will be the sole judge of whether the proposed "or equal" is suitable for use in the work.

Each Bidder represents their bid is based upon the materials and equipment described in these specifications. Substitutions will not be considered unless a written request has been submitted to in accordance with Item L-106, Submittals, Record Documents and Maintenance Manuals.

If the Contractor desires to use a method or type of equipment other than specified in the contract documents, a written request therefore must be made to the RPR. If approval is given, the Contractor will not be excused from producing work in conformity with contract requirements. If a trial use establishes that work does not meet the contract requirements, the Contractor must take such action as the RPR determines necessary to correct any deficiency in the work. No change in contract time will be made as a result of changes made under this Subparagraph. By making a request for substitution, the Contractor:

a. Represents that it has personally investigated the proposed substitution and determined the proposed substitution equal or superior in all respects to the specified method or equipment;

b. Represents that it will provide a warranty for the substitution identical in all respects to the warranty for the specified method or equipment;

c. Represents that it will coordinate the installation of the accepted substitute, making changes as may be required for the work to be complete in all respects at no additional cost to the Owner.

PROTECTION OF MATERIALS, EQUIPMENT AND WORK

100-5.1 Requirement for the Protection of Materials, Equipment and Work. Materials must be stored so as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, will be subject to reinspection prior to their use in the work. The Contractor must coordinate the storage of all materials with the Owner/RPR.

Owner-furnished materials will be made available to the Contractor a location on airport property as specified during construction, if applicable. Upon issuing the notice to proceed and the transfer of the equipment to the Contractor, the Owner-furnished materials will be become the legal responsibility of the Contractor. The material must be secured and protected from damage by the Contractor and at the Contractors expense and at the Contractors stagging area. All costs of transporting the Owner-furnished materials from the Owner's current location to the Contractors staging area must be by the Contractor and must be done in a manner that does not damage the Owner-furnished materials. Any damage to equipment while the Contractor is transporting the equipment must be remedied by the Contractor and at the Contractor expense with all repairs or replacement being approved in writing by the Owner. The Owner will be entitled to deduct from any monies due or to become due to the Contractor any cost incurred by the Owner resulting directly or indirectly from a loss caused in whole or in part by the Contractor's handling, storage or use of Owner-furnished materials.

The Contractor must protect electrical raceway, cables of any sort, lighting fixtures and associated support systems against damage from movement of equipment and material, welding, flame cutting, and other construction damage. Raceways and supporting structures for raceway and lighting fixtures must not be used as access scaffolding at any time. Whenever welding or flame cutting operations occur above or near raceways, cables or lighting fixtures not shielded from such operations by concrete floor or other protective covers, the Contractor must protect the raceways, cables, and lighting fixtures from damage by means of fireproof boards or blankets. Damaged materials must be repaired or replaced, by and at the Contractor's expense, subject to the RPR's direction and acceptance.

Surfaces of most equipment, such as panels, switchgear, transformers, constant current regulators and circuit breakers, are finished at the factory. Great care must be exercised to prevent damage to this original finish during installation of the equipment and during construction work.

If the factory finish is damaged during the course of construction, the entire surface of the damaged component must be refinished or replaced by and at the expense of the Contractor.

The refinished surface must be equivalent in every respect to the original surface, including color, texture and smoothness. Refinishing paint, if furnished with the equipment, may be used; otherwise, the paint must be obtained from the equipment manufacturer.

All cut edges of galvanized materials and marred or scratched galvanized surfaces must be repaired using LPS-1G cold galvanizing compound or approved equal.

All threaded conduit joints must use T&B Kopr-shield or Aluma-Shield or approved equal for galvanized and aluminum conduits respectively, as joint compound.

GENERAL CONSTRUCTION REQUIREMENTS

100-6.1 Additional Requirements. Provide the bracing, shoring, rails, guards, and covers necessary to prevent damage or injury. Do not leave energized electrical items unnecessarily exposed or unprotected. Protect personnel from exposure to contact with electricity. Deliver equipment and materials to the job site in their original, unopened, labeled containers. Store ferrous materials so as to prevent rusting. Store finished materials and equipment so as to prevent staining and discoloring.

All materials stored prior to installation, must be stored in a bonded and secured facility.

All sheeting, shoring, dewatering and cleaning necessary to keep trenches and their grades in proper condition for the work to be carried on, including the removal of water by mechanical means, will be the Contractor's responsibility.

METHOD OF MEASUREMENT

100-7.1 The items described in this section are incidental to other sections and must not be measured for payment.

BASIS OF PAYMENT

100-8.1 No direct payment will be made for the work described in this specification. The work described in this specification is incidental to other items and must be paid for in the respective bid item of which it is a component part.

END OF ITEM L-100

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ITEM L-104

GENERAL ELECTRICAL SAFETY REQUIREMENTS AND TEMPORARY AIRFIELD LIGHTING

104-1.1 PURPOSE. The purpose of this item is to establish the proper safety guidelines necessary to protect aircraft, passengers, crews, the general public, all workers and vehicles involved in their daily tasks. The Contractor is solely responsible for all issues related to the safety program and guidelines and implementation of such programs and guidelines necessary to protect aircraft, passengers, crews, the general public, all workers and vehicles involved in their daily tasks.

104-1.2 FAA ADVISORY CIRCULARS. All applicable requirements of the below listed Advisory Circulars, latest edition, standards and related reading shall be complied with:

150/5200-18	Airport Safety Self-Inspection (Latest Edition)
150/5210-5	Painting, Marking and Lighting of Vehicles used on an Airport (Latest Edition)
150/5340-18	Standards for Airport Sign Systems (Latest Edition)
150/5340-26	Maintenance of Airport Visual Aid Facilities. (Latest Edition)
150/5340-30	Design and Installation Details for Airport Visual Aids (Latest Edition)
150/5370-2	Operational Safety on Airports during construction (Latest Edition)
Occupational Safety and Health Standards for the construction industry 29 CFR Part 1926/1910	
ANSI C2	National Electrical Safety Code (Latest Edition)
NFPA 70	National Electrical Code (Latest Edition)
NFPA 70E	Standard for Electrical Safety Requirements for Employee Workplaces (Latest Edition)

The Contractor is responsible for obtaining and using the latest edition of the referenced FAA Advisory Circulars and related standards. This list is not all inclusive but is offered as a convenience to the Contractor.

104-1.3 GENERAL SAFETY PROVISIONS. The Contractor shall take safety and health measures in performing work under this contract. The Contractor shall meet with the RPR to develop a mutual understanding relative to administration of the safety requirements. The Contractor is subject to applicable federal, state and local laws, regulations, ordinances, codes and orders relating to safety and health in effect on the date of this contract. Attention is invited to the regulations issued by the Secretary of Labor pursuant to the Contract Work Hours and

Safety Standards Act and the Safety and Health Regulations for construction. The Contractor shall comply with the Secretary's Regulations as applicable and shall comply with specific requirements stated.

As a minimum, workplace safety shall comply with NFPA 70E Standard for Electrical Safety Requirements for Employee Workplaces, OSHA, federal, state and local requirements. Where a conflict in code requirements occurs the most stringent requirement shall govern.

During the performance of work under this contract, the Contractor shall comply with procedures prescribed for control and safety of persons visiting the project site.

The Contractor is responsible for his personnel and for familiarizing each of his subcontractors with safety requirements.

The Contractor shall advise the RPR of any special safety restrictions he has established so that the Owner personnel can be notified of these restrictions.

104-1.4 FIRE PREVENTION AND PROTECTION. All tools producing sparks or heat, open-flame heating devices, or operations utilizing such devices, etc., shall be in accordance with the local Fire Department.

Open-flame heating devices will not be permitted except by approval in writing by the RPR. Such permission will not be granted unless the Contractor has taken reasonable precautions to make such devices safe. Burning trash, brush or wood on the project site will not be permitted. Approval for use of open fires and open-flame heating devices will in no way relieve the Contractor from the responsibility for any damage incurred because of fires.

Flammable liquids shall be stored and handled in accordance with the Flammable and Combustible Liquids Code, NFPA 30. Open fires and salamanders will not be permitted in construction areas.

Smoking will not be permitted within the Air Operations Area (AOA). No smoking signs shall be strategically and visibility located near areas such as paint storage, fuel storage, and all other areas.

Welding, flame cutting, melting and other such operations in all operating areas, shall not be permitted. .

104-1.5 REMOVAL OF EQUIPMENT. When permanently removing equipment, the electrical wiring, conduit and control boxes shall be removed to the source of feed, unless otherwise specified or indicated. After equipment has been removed, the electrical wiring diagrams, schematics, etc., shall be marked to show the change. Conduit not removed shall have a pull string installed.

104-1.6 OTHER SAFETY REQUIREMENTS. Temporary wiring shall comply with NEC. Indiscriminate use of extension cords, portable cable or junction boxes creating tripping hazards as well as overloaded circuits will not be permitted. Unplug portable electrical hand tools when not in use. Before working on, maintaining or repairing any electrical equipment, it shall be disconnected from the power source. Do not use any equipment that has frayed cords or three-wire plugs that have had the grounding prongs removed. Faulty equipment and tools shall be repaired by qualified electrical personnel. Do not use metal ladders when working on electrical equipment.

104-1.7 AIRFIELD LIGHTING CABLE. The requirements of L-824 airfield lighting cable

shall be per specification of L-108.

EXCAVATION

104-2.1 EXCAVATION OPERATIONS. Methods of excavation, means of earth support, and manner of backfill shall be conducted with consideration for the safety of persons and work, and prevention of damage to adjacent pavement, utilities, structures, and other facilities, due to settlement, lateral movement, undermining and washout. Excavation shall be performed in a manner to prevent surface water and subsurface or ground water from flowing into excavations, and to prevent water from flooding conduit trench and adjacent or surrounding area.

The Contractor and all his subcontractors performing trench excavation on this contract shall comply with the State Trench Safety Act in which the project is occurring and the Occupational Safety and Health Administration's (OSHA) trench excavation safety standards, 29 C.F.R., subpart P, s.1926.650, including all subsequent revisions or updates to these standards as adopted by the Department of Labor and Employment Security (DLES). The Contractor shall consider all available geotechnical information in his design of the trench excavation safety system. Inspections required by OSHA trench excavation safety standards shall be provided by the Contractor.

PROTECTION OF WORK

104-3.1 PROTECTION OF WORK. Provide adequate stand-by mechanical equipment for emergency use. Excavations shall have substantial barricades and be posted with warning signs for the safety of persons. Warning lights shall be provided during hours of darkness.

Barricades shall be erected immediately around manhole openings when covers are removed or opened.
For personnel safety and to prevent interruption of major utility services encountered during excavation, the following procedures shall be followed:

a. Prior to performing any excavation work or any surface penetrations 6-inches or deeper (such as driving stakes more than 6-inches in the ground) on any ground surface, the Contractor shall obtain from the RPR, local utilities, etc., the current up-to-date subsurface utility drawing of the area to be worked on.

b. All Agencies/Utilities, etc. that may be affected by the excavating shall be contacted by the Contractor so that all lines, pipes, etc., can be marked/staked.

c. The Contractor shall stake out all subsurface utilities i.e., high voltage cables, communication cables, pipelines, etc., indicated within the scope of the work contemplated. All subsurface utilities shall be located by hand digging; hand digging shall extend for 5-feet on both sides of the subsurface utility.

d. After hand exposure of cable or pipelines, the Contractor shall obtain agreement from the RPR, Agency/Utility on how much closer to cable or pipe the excavations can be permitted.

e. Detectable marker tape, with metalized foil core, printed with the words "CAUTION ELECTRIC LINE BELOW," "CAUTION WATER LINE BELOW," "CAUTION SEWER LINE BELOW," etc., as applicable, shall be installed 8-inches below grade over the underground utility. Tape shall be in accordance with Item L-108, Installation of Underground Cable for Airports.

f. The Contractor shall notify the RPR, 72 hours prior to the start of excavation work or surface penetration, to enable the RPR to review measures being taken to prevent hazard to

employees and to prevent damage to subsurface utilities. Where emergency conditions preclude the 72 hours advance notification, the Contractor shall nevertheless inform the RPR of his intention to initiate work.

g. After all existing utilities have been located and marked or staked, the Contractor shall proceed with excavating work, or other surface penetration work. However, the Contractor shall temporarily halt any machine excavation work or other surface penetration when approaching within 5-feet of the staked out subsurface utility until the Contractor has hand excavated down to expose the utility to exactly fix its location.

h. No digging, dirt moving or other heavy equipment shall enter physically any approved construction area before all utilities have been located and properly staked out. It is the Contractor's responsibility to locate all utilities before digging, sawing, coring, boring, etc. Any damage caused by digging, sawing, boring, coring, etc., is the Contractor's responsibility for repair. Any damage must be reported immediately to the RPR. No repair shall be attempted without approval.

i. All high voltage cables shall be disconnected before excavation is attempted.

j. The requirements listed above shall be considered incidental to the item for which the excavation is required.

SAFETY TAGGING AND LOCKOUT

104-4.1 SAFETY WITH ELECTRICAL CIRCUITS AND EQUIPMENT. No one may work on an energized circuit without written permission from the RPR. The Contractor's project manager shall review the circumstances and the necessary safety precautions with the RPR prior to giving permission for the "hot" work. The Contractor assumes all liability in connection with any work on energized circuits.

No one may disconnect or cause to be disconnected any electrical circuit before permission is requested from and granted by Airport Operations or their authorized representative through the RPR.

Identification markings on power distribution circuits shall not be relied on for established safe work conditions. Always verify the proper safe "de-energized" conditions with properly operating test equipment.

Before any circuit supplying any FAA equipment, radar, ILS, weather, VORTAC, airport beacon, runway/taxiway lighting equipment or any other equipment is disconnected, permission must first be granted by Airport Operations or FAA through the RPR.

Work shall not commence on any circuit until:

a. The circuit is correctly identified in the presence of the electrical contractor's superintendent or foreman and approved by the RPR.

b. After identity of the circuit is established, and the circuit disconnected, the time and date shall be recorded by the Contractor after approval by the RPR.

c. The safety switch shall be locked in the open position or opened in a manner while work is being performed.

d. The circuit shall be tagged with an approved warning tag by the electrical contractor's superintendent. The tag shall state, the company's name, the electrician's name/cell phone number responsible for the disconnection, date and time and the project name and project number.

Restoration shall be accomplished, and tags removed only by the electrical contractor's superintendent in the presence of the RPR. The Contractor shall record time, date, and operational status of circuit after restoration. No circuit shall be disconnected or unplugged before color code identification by taping. No circuit shall be disconnected at power source before proper safety precautions are taken to prevent accidental restoration.

When possible, circuits shall be restored by the same person who disconnected the circuit. When not possible, Contractor new shift superintendent shall perform restoration with the approval of the RPR.

e. As a minimum, the Lock/Tag/Try procedure shall comply with NFPA 70E and the Owner's requirements. At a minimum, the circuit breaker serving the de-energized lighting circuits shall be open and locked out, the CCR switch should be moved to the off position, the S1 cutout shall be open and locked and the circuit shall be locked out via the existing airfield lighting control system.

TEMPORARY AIRFIELD LIGHTING

104-4.2 TEMPORARY AIRFIELD LIGHTING. Temporary electrical fixtures and conductors are allowable, when necessary, but shall be installed as follows:

a. Where temporary lights are to be installed on a paved surface, temporary lights shall be bolted to the pavement in a manner rendering the light stationery and allowing space for conductors to enter or exit and to be spliced.

b. When the above is not practical, lights shall be fastened to a weighted object adaptable for the purpose and of sufficient weight to inhibit movement by jet engine blast.

c. Temporary conductors supplying temporary lights shall be installed in a rigid galvanized steel conduit system and secured every five feet to prevent movement by jet engine blast.

d. All joints or splices in temporary conductors shall have heat shrink tubing with integral sealant applied to secure mechanical and electrical connection and prevent water entry.

e. All plug-in connections shall have heat shrink tubing with integral sealant applied to prevent accidental disconnection and shall be color code taped to expedite quick, efficient disconnection and restoration.

f. Temporary airfield lighting and signage shall conform as closely as possible to permanent locations normally on the taxiway or runway and that shall guide aircraft in a safe path away from all possible accident-prone areas.

The Contractor shall provide four sets of marked-up, ‘As-Built’ temporary lighting plans to the RPR prior to final temporary lighting and signage connections.

Closed taxiways and runways shall be so marked in a manner acceptable to FAA and the Owner and said marking shall be kept in acceptable condition. This item shall include, at the RPR’s

discretion the temporary removal or covering of airfield signage.

CAUTION: The series lighting circuit must always be complete and the loop closed before a regulator is energized. Normal circuit voltage is than 5,000 volts maximum with open circuit voltage surging to over 10,000-volts. All personnel shall be instructed to protect the integrity of the lighting circuit. Turn off, lock out and tag the constant current regulator at the vault before opening the circuit. Continuity of the circuit shall be checked before the regulator is reconnected and reenergized.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow work schedules established in the plans and specifications or as directed by the RPR. The temporary system shall be installed in accordance with the contract documents, FAA Advisory Circulars and if applicable the National Electrical Code and/or local code requirements.

The Contractor shall provide temporary wiring as required to reconnect existing airfield lighting and signage to provide guidance for aircraft to pass through the construction areas on those taxiways/runways, which must remain open.

It shall be the Contractor's responsibility to determine that all airfield lighting circuits, except those that are serving closed taxiways or runways, are completely operational, using tower controls (if applicable), at the end of each work shift and shall so certify to the RPR before leaving the work site. Day shift report of system operation shall be at 4 p.m. If applicable, the second shift report shall be 1 hour before dark. Any other shift shall report 1-hour prior to the need for airfield lighting or as determined by the RPR. Should bad weather cause poor visibility, the RPR may require additional status reports of system operability and may call for the operation of the lighting system at any time. In the event of lighting system failure, the Contractor shall immediately take the necessary steps to restore proper operation.

Whenever the scope of work requires connection to an existing circuit, the circuit’s insulation resistance shall be tested, in the presence of the RPR. This test shall be performed prior to any activity affecting the respective circuit. The Contractor shall record the results on the forms included in Item L-131 Demonstrations, Tests and Performance Verification. When the circuit is returned to its final condition, the circuit’s insulation resistance shall be checked again in the presence of the RPR. The Contractor shall record the results on the forms included in Item L-131. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs, to the circuit, to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, etc., if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance Manuals, see Item L-106, Submittals, Record Documents and Maintenance Manuals.

All counterpoise or grounding systems, when severed or damaged, shall be immediately repaired by the Contractor in accordance with Item L-108, Installation of Underground Cable for Airports and inspected by the RPR.

No high voltage switch shall be engaged or disengaged under load.

All backhoes, cranes, etc., shall be enclosed by safety pylons or other approved markers and rope festooned between the pylons, where applicable.

All security gates in use by contractors are the responsibility of the Contractor and must be used in a fully secure manner. Any damage to a security gate shall be reported immediately to the

RPR and repaired by and at the Contractors expense.

METHOD OF MEASUREMENT

104-5.1 The items described in this section are incidental to other sections and must not be measured for payment.

BASIS OF PAYMENT

104-6.1 No direct payment will be made for the work described in this specification. The work described in this specification is incidental to other items and must be paid for in the respective bid item of which it is a component part.

END OF ITEM L-104

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ITEM L-105
ALTERATIONS, REMOVAL AND DEMOLITION

GENERAL

105-1.1 DEFINITIONS. Removal shall mean the dismantling of existing materials, components, equipment, and utilities. Removed items shall be handled, prepared for storage, transported to storage areas as specified.

Demolition shall mean the dismantling and disposal of existing materials, components, equipment, and utilities which cannot or will not be reused or which will have no salvage value, or which cannot be reused due to unrepairable damage caused by age, non-demolition related reasons, etc. All demolished items not designated to be turned over to the Owner shall be legally and properly disposed of in a safe manner and at a location acceptable to the Owner.

All items to be turned over to the Owner shall be properly enclosed or placed in 27 gal. tough storage tote in a black with yellow lid (manufactured by HDX or an approved equal) to protect the items from damage and transported by the Contractor to a location on the Owner's property, designated by the RPR.

Storge Tote Box Requirements:

- Weight Capacity 75 lb
- Exterior dimensions (at top of tote) 28.55 in. L x 19.61 in. W x 15.27 in. H
- Interior dimensions (at bottom of tote) 23.5 in. L x 14.5 in. W x 13 in. H
- Tough polypropylene plastic for durability
- Snap-on, lockable lid included
- 27 Gal. capacity holds large items
- General purpose tote
- Can handle at least 900 lbs. of distributed weight stacked on lid
- Handles can withstand at least 680 lbs. of pressure
- Passes a drop test of at least 110 lbs. from 6 ft.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow the work schedule established in the plans and specifications or as directed by the Engineer. The system shall be installed in accordance with the National Electrical Code and/or local code requirements.

The Contractor shall provide temporary wiring as required to reconnect existing circuits to provide guidance for aircraft to pass through the construction areas on those taxiways/runways which must remain open. The Contractor shall check all temporary circuits before dark each day to assure that they are operational. In the event of failure, the Contractor shall immediately take steps to restore operation.

105-1.2 CONDITION OF EXISTING FACILITIES. The Contractor shall verify the areas, conditions, and features necessary to tie into existing construction. This verification shall be done prior to submittal of shop drawings, fabrication or erection, construction or installation. The

Contractor shall be responsible for the accurate tie-in of the new work to existing facilities.

Special attention is called to the fact that there may be conduit, fixtures or other items in the existing systems which must be removed or relocated in order to perform the alteration work. All conduit, wiring, boxes, etc., that do not comply with these specifications shall be removed or corrected to comply with these specifications. All unused conduit not removed shall be identified and a pull line shall be installed. The work shall include all removal and relocation required for completion of the alterations and the new construction.

Whenever the scope of work require connection to an existing circuit, the circuit's insulation resistance shall be tested, in the presence of the Owner and RPR. The Contractor shall record the results on the forms included in these specifications. When the circuit is returned to its final condition, the circuit's insulation resistance shall be checked again in the presence of the Owner and RPR. The Contractor shall record the results on the forms included in these specifications. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance Manuals as described in Item L-106, Submittals, Record Documents and Maintenance Manuals.

105-1.3 OCCUPANCY AND USE OF EXISTING FACILITIES. The Owner will occupy and use the facilities / airfield pavement near the work areas of work during the entire construction period as shown on the safety plan. The Contractor shall be required to plan and coordinate his activities in order to provide all necessary controls for the abatement of dust during all phases of the work.

105-1.4 SAFETY REQUIREMENTS. The Contractor shall conduct alterations and removal operations in a manner that will ensure the safety of persons in accordance with the requirements of CFR 29 PART 1926 and 1910.

105-1.5 CLASSIFICATION OF REMOVED/DEMOLISHED ITEMS. Existing materials and equipment indicated to be removed will be classified as "salvageable" and shall remain the property of the Owner or will be classified as "debris" and shall be disposed of legally off the airport.

Reusable salvaged items:

Salvaged materials and equipment shall be reused in the work as described on the contract drawings, unless noted otherwise.

Items classified as debris shall be legally disposed of off the airport property. The cost of such disposal shall be included in the cost of other items of work.

Retained salvaged items:

Salvaged materials and equipment to be retained by the Owner but not reused in the work shall be

turned over to the Owner at a site at the facility to be determined by the Owner. Retained salvaged items shall be stored on Owner property where indicated by the Owner.

EXECUTION

105-2.1 DISCONNECTING UTILITIES. Prior to the start of work, the necessary utilities serving each area of alteration or removal will be shut off by the Owner and shall be disconnected and sealed by the Contractor, as required. Lockout/Tag/Try procedures shall be utilized in accordance with Item L-104, General Electrical Safety Requirements and Temporary Airfield Lighting.

105-2.2 REMOVAL WORK. The Contractor shall not disturb the existing construction beyond that indicated or necessary for installation of new work.

The Contractor shall provide protective measures to control accumulation and migration of dust and dirt in all areas of work, particularly those adjacent to occupied areas via watering as needed during construction. The Contractor shall remove dust, dirt, and debris from the areas of work daily.

105-2.4 SALVAGEABLE MATERIALS AND EQUIPMENT. The Contractor shall remove all salvageable materials and equipment in a manner that will cause the least possible damage thereto. Removed items which are to be retained by the Owner shall be carefully handled, stored, and protected.

The Contractor shall provide identification tags on all items boxed or placed in containers, indicating the type, size, and quantity of materials.

105-2.5 PROPER STORAGE OF SALVAGEABLE MATERIALS AND EQUIPMENT.
Weatherproof and Temperature-Controlled Storage: Equipment must be stored in a weatherproof environment protected from the elements and at temperatures that prevent damage. Extreme temperatures are to be strictly avoided.

Location: Storage must be on airport property or within designated contractor staging areas, ensuring accessibility and security.

Incidental Costs: Costs associated with the preparation, transportation, and maintenance of equipment during storage are incidental to the salvaged or removed items and are not separately billable.

Condition Documentation: Contractors are required to document the existing condition of all salvaged materials at the time of removal. This documentation must be provided as a submittal to the RPR for information only.

Damage Replacement: Any items found to be damaged after removal and during storage must be replaced by the contractor at no additional cost to the owner.

DEMOLITION

105-3.1 DEMOLITION OPERATIONS. Demolition operations shall be conducted to ensure the safe passage of persons to and from facilities occupied and used by the Owner. The sequence of operations shall be such that maximum protection from inclement weather will be provided for materials and equipment located in partially dismantled structures.

Immediately after demolition of any electrical item, any disturbed area shall be repaired and restore. Any holes shall be filled back to the existing grade per P-152 and regraded to match the surrounding area. Any and all bare spots shall be seeded.

105-3.2 REFERENCE STANDARDS REQUIREMENTS. Demolition operations shall be conducted to ensure the safety of persons in accordance with ANSI A 10.6 Safety Requirements for Demolition.

Demolition shall be conducted in accordance with O.S.H.A., State and local requirements.

DISPOSAL OF DEMOLISHED MATERIALS

105-4.1 GENERAL. The Contractor shall dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from demolition operations. Demolished materials shall not be stored or disposed of on Airport property.

105-4.2 REMOVAL FROM OWNER PROPERTY. Materials classified as debris shall be transported from Owner property and legally disposed at no additional cost to the Owner. Permits and fees for disposal shall be paid by the Contractor.

METHOD OF MEASUREMENT

105-6.1 This item includes all materials, labor, transportation incidentals and services required for the airfield electrical demolition as shown on the plans. It is the intent of the demolition pay item that all equipment, devices, fixtures, wiring, materials, systems and appurtenances, etc. which are no longer required as a result of the project to be removed shall be measured by the contract unit per each. Miscellaneous Electrical Demolition pay item shall be use for all incidental electrical demolition to include but not be limited to cable(s), conduit, ducts, counterpoise, concrete foundations/encasement, ID tags, cable markers, duct markers, frames, racks, and all other miscellaneous electrical equipment, and shall be measured by the contract unit per lump sum.

BASIS OF PAYMENT

105-7.1 Payment will be made at the contract price per each for required airfield electrical demolition items. This item includes all materials, labor, transportation, incidentals, and services required for the demolition as shown on the plans. It is the intent of the demolition pay item that all equipment, devices, fixtures, wiring, materials, systems, concrete foundation, rebar, base can, connectors, ground rods, cables and appurtenances, etc. which are no longer required as a result of

the project be removed and legally disposed off FAY property. Payment will be made at the contract line item “per each” price.item “per lump sum” price.

105-7.2 Payment for miscellaneous airfield electrical demolition not specifically included in bid items L-105-1 thru L-105-4 will be made at the contract price per lump sum. This item includes all materials, labor, transportation, incidentals, and services required for the miscellaneous demolition as shown on the plans. It is the intent of the miscellaneous demolition that all conduit, cable, connectors, transformers, counterpoise, and any other appurtenances, etc. which are no longer required as a result of the project be removed. Payment shall be made at the contract line item “per lump sum” price.

Payment will be made under:

L-105-1	Remove Existing Stake Mounted Light Fixture	per each
L-105-2	Remove Existing Base Mounted Light Fixture and Base Can	per each
L-105-3	Remove Existing In-Pavement Light Fixture and Base Can in Mill/Overlay Pavement	per each
L-105-4	Remove Existing Sign and Foundation	per each
L-105-5	Miscellaneous Electrical Demolition	per lump sum

END OF ITEM L-105

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ITEM L-106

SUBMITTALS, RECORD DOCUMENTS AND MAINTENANCE MANUALS

DESCRIPTION

106-1.1 GENERAL. The items described in this section are applicable to all electrical work by the Contractor. Where the contract special conditions or general provisions also apply, the stricter of the documents shall apply.

106-1.2 SCOPE. This section includes the requirements for submittals, record documents operation and maintenance (O&M) manuals. All submittals and O & M Manuals shall be submitted in book form as described in this item.

SHOP DRAWINGS AND SAMPLES

106-2.1 REQUIREMENTS FOR SHOP DRAWINGS AND SAMPLES. Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the work.

Submittal data for electrical materials and equipment shall consist of shop drawings and/or catalog cuts showing technical data as necessary to evaluate the material or equipment, to include dimensions, wiring diagrams, performance curves, ratings, control sequence and other descriptive data necessary to describe fully the item proposed and its operating characteristics. The shop drawing being submitted for review shall be appropriately marked such that there is no confusion on what item is being submitted, shop drawings without the submitted item marked per section 106-2.3-f. shall be rejected and require resubmission.

Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to establish standards by which the work will be judged. Each sample shall be accompanied by the manufacturer's instructions regarding installation, operation and maintenance and shall be identified by item number, and specification.

The Contractor shall review, stamp with his approval and submit to the RPR all electrical equipment needed for the project and required by the contract documents in an electronic Adobe Acrobat PDF form as described in this item, within fifteen (15) days of notice to proceed.

If the Contractor desires to deviate from the requirements of the contract documents, the Contractor shall separately submit all deviations from the requirements of the contract documents in shop drawings or samples. The submission shall direct in writing the specific attention of the Engineer to the deviations, and shall contain all required data and supporting documentation necessary for an evaluation of the proposed deviation. Any submission or deviation not identified as heretofore mentioned shall be rejected and require resubmission. Separate written approval of all deviations by the Engineer for all design related deviations and

by the Owner for all other deviations is required before the Contractor may perform the work covered by such deviation. By requesting a deviation, the Contractor makes the representations contained in this section.

If approval is given, the Contractor will not be excused from producing work in conformity with contract requirements. If a trial use establishes the work does not meet the contract requirements, the Contractor shall take such action as the Engineer determines necessary to meet the contract requirements. No change in contract time will be made as a result of changes made under this subparagraph. By requesting a deviation, the Contractor makes the representations contained in this section.

106-2.1.1 Substitutions will only be considered after bid date only if the following conditions are met and allowed by other sections of these specifications.

a. Request for substitution is submitted no later than 15 days after notice to proceed for construction is awarded to the Contractor.

b. Request for substitution includes appropriate credit to the project cost. This credit must be submitted with request for substitution in order for substitution to receive any consideration.

c. Samples are to be submitted for all substituted light fixtures, wiring devices and other items deemed necessary by the Engineer to determine that the substituted item meets all specifications and requirements before approval of substitutions can be made.

d. Samples shall be submitted within 15 days after the award of the contract.

e. Request for substitution shall include the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and that data or any other data or information necessary for the Engineer to determine that the equipment meets all specifications and requirements.

f. Where permitted and approved, the substitution must conform to space requirements. Substitutions that cannot meet space requirements, which is the substitution Installer's responsibility whether approved or not, shall be replaced at the Contractor's expense. Any substitution modifications of related systems, as a result of the substitution, shall be made at the Contractor's expense.

g. The Contractor represents that it has personally investigated the proposed substitution and determined that the proposed substitution is equal or superior in all respects to the specified method or equipment.

h. The Contractor represents that it will provide a warranty for the substitution identical in all respects to the warranty for the specified method or equipment.

i. The Contractor represents that it will coordinate the installation of the accepted substitute, making changes as may be required for the work to be complete in all respects at no

additional costs to the Owner.

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

106-2.1.2 Substitutions will be considered prior to bid date only if all the following conditions are met:

a. A written request has been submitted to the Engineer for approval at least 10 days prior to the bid date.

b. Samples are to be submitted for all substituted light fixtures, wiring devices and other items deemed necessary by the Engineer to determine that the substituted item meets all specifications and requirements before approval of substitutions can be made.

c. Samples shall be submitted within 15 days after the award of the contract.

d. Request for substitution shall include the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and that data or any other data or information necessary for the Engineer to determine that the equipment meets all specifications and requirements.

e. Substitution is approved and included in an addendum.

By approving and submitting shop drawings and samples, the Contractor thereby represents that he/she has determined and verified all field measurements, field construction criteria, materials, catalog numbers
and similar data and that the Contractor, has checked and coordinated each shop drawing and sample with the requirements of the work of the contract documents.

Unless otherwise stated in the contract documents, the Engineer will review shop drawings and samples within fifteen (15) days after receipt, but only for general conformance with the design concept of the project and with the information given in the contract documents. The Engineer's review of a separate item shall not indicate approval of an assembly in which the item functions.

The Contractor shall make any corrections required by the Engineer and shall resubmit the shop drawings or new samples until approved. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Engineer on previous submissions.

The Engineer's review of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the contract documents unless the Contractor has informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. The Engineer's review of submittals shall not relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.

The submittals will be reviewed for design intent and general compliance with the information contained in the drawings and specifications. The Contractor is responsible for dimensions, quantities, fabrication processes and methods of construction, coordination of the Contractor's work with that of all trades. The Contractor shall be responsible for satisfactory performance of his work and supplying a complete and operational system.

No portion of the work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by the RPR. All such portions of the work shall be in accordance with approved shop drawings and samples.

Samples, upon request, shall be submitted after written notice of acceptance and approval has been made of each substitution. The RPR reserves the right to reject the sample should the sample not meet the requirement of the contract documents.

106-2.3 SUBMITTAL CONTENTS. Submittal books to include:

a. First sheet(s) in book shall be a photocopy of the cover sheet see Appendix A Figure 1.

b. The second sheet shall be a table of contents.

c. Third sheet shall be prepared and filled out by the Contractor and shall list project addresses, see Appendix A Figure 3.

d. Fourth sheet shall also be filled out by Contractor and list project information for project, Appendix A Figure 4.

e. Submittal data shall be presented in a clear and thorough manner. Original catalog sheets are required and material content of the submittal shall not be altered. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify pertinent products or models applicable to this project. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable). Indicate all optional equipment and delete non-pertinent. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable).

f. Shop Drawings: Drawings to include identification of project and name of Engineer, Contractor, subcontractors and suppliers, data, number sequentially and indicate the following:

(1) Fabrication and erection dimensions.

(2) Arrangements and sectional views.

(3) Necessary details, including complete information for making connections with other work.

(4) Kinds of materials and finishes.

(5) Descriptive names of equipment.

(6) Modifications and options to standard equipment required by the work.

(7) Leave blank area, size approximately 4 x 2 ½ inches, near title block (Engineer's stamp imprint).

(8) Point-to-point wiring diagrams.

(9) Conduit/raceway rough-in drawings.

(10) See specific sections of specifications for further requirements.

106-2.4 SUBMITTAL OF PRODUCT DATA. Technical data is required for all items as called for in the specifications regardless if item furnished is as specified.

a. Submit technical data verifying that the item submitted complies with the requirements of the specifications. Technical data shall include manufacturer's name and model number, dimensions, weights, electrical characteristics, and clearances required. Indicate all optional equipment and changes from the standard item as called for in the specifications. Furnish drawings, or diagrams, dimensioned and in correct scale, covering equipment, showing arrangement of components and overall coordination.

b. In order to facilitate review of product data, insofar as practicable, they shall be noted, indicating by cross reference the contract drawings, note, and/or specification paragraph numbers where item(s) occur in the contract documents. At the end of each section insert a copy of the applicable specification.

c. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for product data. Identify conflicts between manufacturers' instructions and contract documents. The Engineer shall make the decision on which procedure will be followed.

d. When specified in individual specification sections, submit manufacturers' certificate to the Engineer for review in quantities specified for product data. Indicate that material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits and certifications as appropriate. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

e. See specific sections of specifications for further requirements.

106-2.5 PROCESSING SUBMITTALS. Submit a properly organized electronic submittal as a PDF of all applicable information. No request for payment will be considered until the submittal has been reviewed and submitted for approval.

Submit under provisions Section 1. of the Special Conditions and this section of the specifications, whichever is the most-strict.

Product Data: For standard manufactured materials, products and items, submit one (1) PDF copy or sets of data (per book). If submittal is rejected, resubmittal shall contain same quantity of new data.

Acceptance: When returned to Contractor, the front of each submittal section will be marked with the Engineers stamp. If box marked "Submit Specified Item", or "Rejected" or "Revise and Resubmit" is checked, submittal is not accepted and Contractor is to correct and resubmit as noted. Contractor is to comply with notation making necessary corrections on submittal and resubmit for final record. If submittal is marked "Make Correction Noted" Contractor may begin construction utilizing the submitted item with corrections made. However, the corrected submittal must be resubmitted for record keeping purposes. Contractor is to comply with notation making necessary corrections on submittal and resubmit for final record.

If the submittal is marked "No Exception Taken" the Engineer took no exceptions to the submitted.

If the submittal is marked "Furnished as Noted", the Contractor shall make or note any corrections or requirements identified in the comments. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the drawings and specifications. This check is only for review of the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for; confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his or her work with that of all other trades and performing all work in a safe and satisfactory manner.

Note that the approval of shop drawings or other information submitted in accordance with the requirements herein before specified, does not assure that the Engineer, or any other Owner's authorized representative, attests to the dimensional accuracy or dimensional suitability of the material or equipment involved, the ability of the material or equipment involved or the mechanical/electrical performance of equipment. Approval of shop drawings does not invalidate the plans and specifications if in conflict, unless a letter requesting such a change is submitted and approved on the Engineer's letterhead.

106-2.8 DELAYS. The Contractor is responsible for delays in project time accruing directly or indirectly from late submissions or resubmissions of shop drawings, or product data.

106-2.9 RE-SUBMITTALS. The Engineer shall be reimbursed the cost to review resubmittals subsequent to the second submittal.

RECORD DOCUMENTS

106-3.1 PROGRESS AND RECORD DRAWINGS. Keep one set of blue line prints on the job and neatly mark-up design drawings each day as components are installed. Different colored pencils shall be used to differentiate each system of electrical work. All items on progress drawings shall be shown in actual location installed. Drawings shall be inspected weekly for compliance and accuracy. Progress payments shall be withheld if the marked-up drawings are not current.

All underground ducts, conduits, drains, ground grids, force mains, etc., (all underground utilities) installed by the Contractor or located by the Contractor during the construction of this project shall be surveyed. The data shall be sufficient to accurately relocate the utility at a later date. The data shall include North-South and East-West coordinates and an elevation. This data shall be recorded on the as-built drawings.

All manholes and other structures installed by the Contractor shall be surveyed. The center of the structure shall be located by a North-South and East-West coordinate and an elevation. This data shall be recorded on the as-built drawings.

Change the equipment schedules to agree with items actually furnished. At the end of the project, all changes shall be transferred to a set of reproducible transparencies of the design drawings marked "As Built" and dated and stamped by the Contractor.

Prior to request for final payment, furnish a set of "As Built" sepia originals and four sets of prints along with the marked set defined above to the Engineer for approval. The final sepia originals shall be professionally drafted to indicate "As Built" conditions to the Engineer. The prints shall be stamped "As-Built", signed and dated by the electrical contractor.

The Contractor's failure to produce representative "As Built" drawings in accordance with requirements specified herein, shall be cause for the Engineer to produce such "As-built" drawings and the Contractor shall reimburse the Engineer for all costs to produce a set of "Record" drawings to the Owner’s satisfaction.

Complete and sign the Progress and Record Document Certification Form in Appendix A Figure 5 and submit with the Operation and Maintenance Manuals. Submit one form for each Contractor/Subcontractor providing as-built information, include a copy of each form in the O & M Manuals.

OPERATION AND MAINTENANCE MANUALS

106-4.1 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS. Within each major division of work, each specification section in the contract documents which require submission of O & M information shall be individually identified by a typed index tab. The Contractor shall provide four (4) copies of manufacturer's manuals for all installed equipment. As a minimum, it shall contain the following:

a. Safety precautions used while maintaining the equipment.

b. Theory of circuit and system operation.

c. Complete schematic and interconnecting wiring diagrams

d. Complete parts list with each circuit component keyed to designations assigned on schematics and wiring diagrams. Complete information shall be given for each part to permit ordering for replacement purposes. This information shall include the components rating, name of manufacturer and the manufacturer's part number in addition to the following:

e. Recommended preventive maintenance, including care, cleaning, lubrication, service schedules, etc.

f. Troubleshooting procedures.

g. Physical characteristics (weight, size, mounting dimensions, etc.).

h. Installation instructions.

i. Operating instructions.

j. Recommended spare parts and usage for a 1 year period.

k. Submit for checking purposes a specific set of written operating instructions on each item which requires instructions to operate. After approval, provide one copy for insertion in each Operation and Maintenance Manual.

l. Submit for approval maintenance information consisting of manufacturer's printed instructions and parts list for each major item of equipment. After approval, insert information in each Operations and Maintenance Manual. Detailed schematic diagrams shall be furnished for all electrical/electronic equipment.

m. Bill of materials.

n. Physical layout plans.

o. Equipment supplier list.

p. Panel schedules shall be submitted with the respective panel data.

q. Special instructions.

r. Service maintenance contracts including the name, address and 24-hour phone number and contact of manufacturers authorized repair company.

There shall be no "Black Boxes" for which there are no schematic/wiring diagrams.

106-4.2 OPERATION AND MAINTENANCE MANUALS. O & M Manuals shall consist of one properly organized PDF per O & M manual.

106-4.3 OPERATION AND MAINTENANCE MANUAL CONTENTS. O & M Manuals to include:

a. First sheet in the PDF shall be the cover sheet see Appendix A Figure 6.

b. The second sheet shall be a table of contents.

c. The third sheet shall be filled out by the Contractor and shall list project addresses, see Appendix A Figure 3.

d. The fourth sheet shall also be filled out by the Contractor and list project information for project, see Appendix A Figure 4.

e. Shop Drawings: Shop drawings shall be a copy of the final and approved shop drawings submitted as required in Item L-106-2, Shop Drawings and Samples. Each catalog sheet shall clearly identify where the product is used and the drawing identification for equipment.

g. Product data and/or catalog sheets shall be a copy of the final and approved submittal submitted as required in Item L-106-2, Shop Drawings and Samples. Each catalog sheet shall clearly identify where the product is used and the drawing identification for equipment.

h. Warranty/Guarantee: Provide a copy of the warranty/guarantee and letters of certification, in respective locations in the O & M Manual. Original warranty/guarantee is to be incorporated into a separate project warranty book with warranty/guarantees provided for other sections and divisions of the specifications and submitted for Engineer approval.

i. Performance Verification and Demonstration to Owner (See Appendix A Figure 2 form in L-131, Demonstrations, Tests and Performance Verification).

j. Tabulated Data (as required in L-131, Demonstrations, Tests and Performance Verification).

k. Required Check-Out Memos (see Appendix A Figure 1 form in L-131, Demonstrations, Tests and Performance Verification).

l. Progress and Record Drawing Certification (Appendix A Figure 5)

m. Ground Test Information (See Appendix A Figure 3 form in L-131, Demonstrations, Tests and Performance Verification).

106-4.4 PROCESSING O & M MANUALS. Submit four (4) sets of O & M Manuals. The Contractor shall review the manuals before submitting them to the Engineer.

106-4.5 DELAYS. The Contractor is responsible for delays in project time accruing directly or indirectly from late submissions or resubmissions of the Operation and Maintenance Manuals.

106-4.6 RE-SUBMITTALS. The Engineer shall be reimbursed the cost to review Operation and Maintenance Manuals, re-submittals subsequent to the second submittal.

METHOD OF MEASUREMENT

106-5.1 The items described in this section are incidental to other sections and not shall be measured for payment.

BASIS OF PAYMENT

106-6.1 No direct payment shall be made for the work described in this section. The work described in this section is incidental to other items and shall be paid for in the respective bid item of which it is a component part.

"EXAMPLE"

FAYETTEVILLE REGIONAL AIRPORT
FAYETTEVILLE, NC

TAXIWAY F AND G REHABILITATION

AIRFIELD LIGHTING SUBMITTAL BOOK

July xx, 2026

APPENDIX A - FIGURE 1

"EXAMPLE"

FAYETTEVILLE REGIONAL AIRPORT
FAYETTEVILLE, NC

TAXIWAY F AND G REHABILITATION

AIRFIELD LIGHTING SUBMITTAL BOOK

July xx, 2026

APPENDIX A - FIGURE 2

PROJECT ADDRESSES

OWNER:
Fayetteville Regional Airport (FAY)
Fayetteville, NC
400 Airport Rd, Fayetteville, NC 28306
(910) 433-1160

(910) 862-4522
CONSULTING ENGINEERS:
RS&H
8521 Six Forks Rd, Suite 400, Raleigh NC 27615
Raleigh NC 27615
919-926-4112

Walls Engineering, pllc
8226 Creedmoor Rd
Suite 201
Raleigh, NC 27613
919-522-0628

GENERAL CONTRACTOR:

SUBCONTRACTORS:

SUPPLIERS:

APPENDIX A - FIGURE 3

PROJECT INFORMATION

Contractor shall fill in the blanks below and insert in the Submittal Books and the Operating and Maintenance Manuals. Submit one (1) sheet for each major division of Work.

Project Name TAXIWAY F AND G REHABILITATION FOR THE FAYETTEVILLE REGIONAL AIRPORT (FAY)

Specification Division Number & Name: _____

Subcontractor: _____

Contact: _____ Phone Number: _____

Date Project Bid: _____

Project Start Date: _____

Days Allowed for Construction: _____

Target Completion: _____

Substantial Completion: _____

Certification Date: _____

	DATE SUBMITTED	DATE SUBMITTED
Closeout Documentation Manual:	_____	_____
Operating & Maintenance Manual:	_____	_____
Owner Performance Verification and Demonstrations:	_____	_____
Manufacturer's Performance Verification Memos:	_____	_____
Manufacturer's Test Data:	_____	_____
Record Documents:	_____	_____

APPENDIX A FIGURE 4

PROGRESS AND RECORD DRAWING CERTIFICATION

This form shall be completed and submitted with the Record Documents. Submit one form for each Contractor/Subcontractor providing as-built information. Include a copy of this form in the Closeout Documentation Manual.

Project Name: TAXIWAY F AND G REHABILITATION FOR THE FAYETTEVILLE REGIONAL AIRPORT (FAY)

Specification Division Number & Name: _____

The Contractor's and Subcontractor's signatures below certify that the attached drawings and specifications were marked and revised as items were installed/changed, during the course of construction, and that these documents represent an accurate "Record-As Built" condition of the work as actually installed.

_____
(Name of General Contractor)

_____
(Signature, Title, Date)

_____
(Name of Subcontractor)

_____
(Signature, Title, Date)

APPENDIX A - FIGURE 5

"EXAMPLE"

FAYETTEVILLE REGIONAL AIRPORT
FAYETTEVILLE, NC

TAXIWAY F AND G REHABILITATION

AIRFIELD LIGHTING OPERATION AND MAINTENANCE MANUALS

APPENDIX A - FIGURE 6

"EXAMPLE"

FAYETTEVILLE REGIONAL AIRPORT
FAYETTEVILLE, NC

TAXIWAY F AND G REHABILITATION

OPERATION AND MAINTENANCE MANUAL

APPENDIX A - FIGURE 7

ELECTRICAL MATERIALS SUBMITTAL LIST

This material submittal list is not all inclusive but is offered as a convenience to the Contractor.

Spec. Section Number	Submittal Description	Date Received	Date Returned	Status
L-100	Certification of Electrical Contractor's Experience Copy of Electrical Contractor's applicable State Electrical License Certification of Electrical Superintendent's Experience Electrical Superintendent's resume' and copy of Journeyman Electrician License Electrical Superintendent's References, Airport Name, Contact and phone number Copy of each Journeyman Electrician's License Copy of each Apprentice Electrician's License Existing Facilities Investigation Memorandum Phenolic nameplates - 1 to 1 scale detail of each nameplate SS pop rivets and silicone caulk Adhesive backed cloth markers Color code paint Permanent black marker Self-adhesive clear printed labels w/ black typed letters Welder qualifications Welding procedures Written verification providing proof of correspondence with representatives of all utilities/agencies to locate all existing utilities/systems within the project limits			
L-104	Temporary Airfield Lighting Plan and Procedures Temporary Airfield Lighting, Signage and Cabling			
L-108	Each component shall be identified with the specific pay item of which it is a component part. List of proposed Airfield Lighting Cable Splicers Airfield Lighting Cable Splicer Qualifications Cable Installation Plan Cable Installation Reports All wire, conductors and cable assemblies			

	including manufacturer's minimum cold weather installation temperature, minimum bend radius, maximum pull tension L-824 5kV cable L-824 5kV cable Production Test Reports L-823 Connector Kits Counterpoise Wire Ground Wire Compression butt splices Compression lugs C-Taps Compression tooling, calibration certificate, procedures and manufacturer's recommended practices Penciling tool Mechanical lugs and torquing requirements Torque wrench, calibration certificate and manufacturer's recommended practices Wire nuts Terminal blocks Insulation replacement systems, i.e. tapes, heat shrink tubing, etc. Electrical coatings Joint compound Pull ropes Cable pulling lubricant Color coding materials and/or methods Detectable marker tape with message and color Wire/cable markers Brass ID Tags and cable ties Brass ID Tag stamped samples - 3 samples for each circuit impacted Stainless steel wire mesh strain relief baskets for 5 kV cables Copper-clad steel ground rods Ground rod couplings Ground rod driving studs Exothermic connections Electrical coatings			

	Electrical joint compound Grounding conductors Copper bus bar by size, type and use Ground rod inspection pit			
L-110	Rigid galvanized steel (RGS) conduit Weatherproof conduit hubs Locknuts Grounding bushings w/ insulated throat Bushings w/ insulated throat Condulets, covers and gaskets Expansion fittings Conduit thread compound Long radius RGS bends Cold galvanizing compound Asphaltum paint Schedule 40 PVC conduit Schedule 40 PVC end bells, fittings, terminations, cleaner and solvent cement Schedule 40 PVC duct spacers and duct plugs Expansion fittings Split duct and fittings Inner duct and fittings E-LOC Couplings P-610 concrete mix Cable racks, supports, ties and straps detectable marker tape Drain sumps Each item submitted shall include the contractors proposed installation detail			
L-115	Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item. Handholes Junction Boxes Junction Box Plazas Each item's submittal shall include the following as required:			

	Signed and sealed shop drawings by a registered structural P.E. in the applicable state Grounding attachments Covers, frames, rings, etc. Spring assist mechanisms Pulling irons Cable racks Section sealant/mastic Reinforcement bars and wire mesh All accessories Each item submitted shall include the contractors proposed installation detail. All other components not previously listed or as requested by the Engineer.			
L-125	Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item. Shop drawings of each airfield lighting component, indicating FAA approval, shall be submitted to the Engineer for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all airfield lighting components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use. The manufacturer of the signs proposed shall provide data, certification, and five (5) airport references that each type of proposed fixture, as currently designed unless a new design that has not been required in the United States heretofore, has been in operation under normal airfield conditions a minimum of 3 years with a certified repair requirement rate of no more than three (3) percent. Spare parts guarantee Lamp prices and price guarantee			

	Survey of existing fixtures, base cans Airfield lighting fixture manufacturer qualifications Identification/number markers Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound **L-858Y, R, L Signs** - including as applicable: signs, light bases (base cans), extensions and top sections, covers, gaskets, ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, sign tethers, SS anchor bolts, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals. Replacement Sign Panels Misc Sign Items L-858 sign message schedule Sign load calculation or test results supporting 200mph requirement per AC 150/5345-44 Vinyl die cut labels and sample **L-867B Base Can** **L-867D Base Can** **L-858Y, R, L, B sign panels** **Anti-Seize lube compound** **Spare Parts** Non-reflective cracking fabric Epoxy bonding compound including pavement compatibility statement Rebar P-610 All bolting hardware not previously submitted Each item submitted shall include the contractors proposed installation detail.			

	All other components not previously listed or as requested by the Engineer.			
L-125	Each component shall be identified with the specific pay item of which it is a component part. Complete assemblies shall be submitted for each pay item. Shop drawings of each airfield lighting component, indicating FAA approval, shall be submitted to the Engineer for review and approval and be approved prior to ordering any materials for this item. This submittal shall include the proposed method of installation for all airfield lighting components. The submittal shall include data on all component parts of the item or system, and shall include the manufacturers list of recommended spare parts for one years use. The manufacturer of the lighting fixtures proposed shall provide data, certification, and five (5) airport references that each type of proposed fixture, as currently designed unless a new design that has not been required in the United States heretofore, has been in operation under normal airfield conditions a minimum of 3 years with a certified repair requirement rate of no more than three (3) percent. Spare parts guarantee Lamp prices and price guarantee Survey of existing fixtures, base cans, etc. Airfield lighting fixture manufacturer qualifications Reinforcing steel SS bolting hardware including anti-rotational devices Anti-seize compound **Elevated Edge Light** - including as applicable: light fixture, L-867B light bases (base cans), extensions and top sections, covers, gaskets,			

	ground lugs, load rings, anti-rotational fins, spacer rings, flange rings, adapter rings, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals. Airfield Signage – including as applicable: sign unit, L-867B light bases (base cans), covers, gaskets, ground lugs, SS bolting hardware, L-830 isolation transformers, frangible couplings, lamps, installation detail, all components, accessories and incidentals. **Anti-Seize lube compound** **Spare Parts** Non-reflective cracking fabric Epoxy bonding compound including pavement compatibility statement Rebar P-610 All bolting hardware not previously submitted Each item submitted shall include the contractors proposed installation detail. All other components not previously listed or as requested by the Engineer.			
L-131	Submit all materials, test equipment, written procedures, forms, and equipment calibration certificates for performing the following tests: Calibration Lab Qualifications Equipment dielectric testing Cable/conductor dielectric testing Qualifications of firm performing dielectric testing Insulation resistance (megger) testing Fixture wiring sequence testing procedure Lighting system burn-in Airfield lighting photometric testing procedure and equipment Qualifications of firm performing airfield lighting photometric testing			

	Constant current regulator test procedures, test equipment, calibration procedures Airfield Lighting Control System and associated equipment Acceptance Testing Torquing of electrical terminations Torquing of anchor bolts Earth resistance testing Ground continuity/resistance testing Exothermic weld tests Equipment and support welding Transformer tests Testing required by equipment manuf. Welding procedures Welder qualifications Pavement sensor testing procedure, commissioning procedure and results All other components not previously listed or as requested by the Engineer.			

END OF ITEM L-106

Item L-108 Underground Power Cable for Airports

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the RPR. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.

EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted

in pdf format. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, Maintenance Airport Visual Aid Facilities, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #8 American wire gauge (AWG), L-824 Type C , 5,000 volts, non-shielded, with cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 Type C , 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type XHHW, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, XHHW, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of XHHW 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6AWG bare

solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet long and 3/4 inch in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

b. The field-attached plug-in splice. Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 Flowable backfill. Not used.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the RPR or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor’s expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left

sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

~~**a. Trenching.** Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:~~

~~When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.~~

~~Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.~~

~~The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.~~

~~When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill material may alternatively be used.~~

~~Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.~~

~~It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:~~

~~**(1)** Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.~~

~~**(2)** Trenching, etc., in cable areas shall then proceed, with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.~~

~~In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair or replacement.~~

~~**b. Backfilling.** After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches (125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.~~

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557.

Trenches shall not contain pools of water during backfilling operations. The trench shall be completely backfilled and tamped level with the adjacent surface, except that when turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.

Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the RPR. If not shown on the plans, the warning tape shall be located 6 inches (150 mm) above

the direct-buried cable or the counterpoise wire if present. A 3-6 inch (75 - 150 mm) wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches (200 mm) minimum below finished grade.

c. Restoration. Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the **sodding** and seeding as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557. Restoration shall be considered incidental to the pay item of which it is a component part.

108-3.4 Cable markers for direct-buried cable. The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet (60 cm) square and 4-6 inch (10 - 15 cm) thick, extending approximately one inch (25 mm) above the surface. Each cable run from a line of lights and signs to the equipment vault shall be marked at approximately every 200 feet (61 m) along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word “CABLE” and directional arrows on each cable marking slab. The letters shall be approximately 4 inches (100 mm) high and 3 inches (75 mm) wide, with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.

At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word “SPLICE” on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the RPR. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or splice markers shall be given one coat of high-visibility aviation orange paint as approved by the RPR. Furnishing and installation of cable markers is incidental to the respective cable pay item.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer’s instructions and to the satisfaction of the RPR.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer’s instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint (2) Covered

with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) Wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer’s instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer’s recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch (6.4 mm) beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. [Not used]

b. Isolation. Counterpoise size is as shown on the plans. The isolation method is an alternate method for use only with edge lights installed in turf and stabilized soils and raceways installed parallel to and adjacent to the edge of the pavement. NFPA 780 uses 15 feet to define "adjacent to".

The counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable being protected.

The counterpoise conductor shall be installed 8 inches (203 mm) minimum below grade. The counterpoise is not connected to the light base or mounting stake. An additional grounding electrode is required at each light base or mounting stake. The grounding electrode is bonded to the light base or mounting stake with a 6 AWG solid copper conductor.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Isolation Method of lightning protection.

c. Common Installation requirements. When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When

multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M™ Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the RPR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the RPR. All such testing shall be at the sole expense of the Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The RPR shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the RPR the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than **100** megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the RPR prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the RPR. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved “repair” procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 Cable or counterpoise wire installed in duct bank or conduit shall be measured by the number of linear feet of cable or counterpoise wire installed in trenches, duct bank, or conduit, including ground rods and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack. This measurement shall include an additional supplemental ground rod required if the first ground rod does not reach ground resistance requirements. Cable and counterpoise slack is considered incidental to this item and is included in the Contractor’s unit price. No separate measurement or payment will be made for cable or counterpoise slack.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for cable, bare counterpoise, and equipment ground installed in duct bank or conduit, and any required additional supplemental

ground rods installed, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

L-108-1	No. 6 AWG, Solid, Bare Counterpoise Wire, Installed in Trench, Above the Duct Bank or Conduit, Including Ground Rods (Initial and Supplemental) and Ground Connectors	per linear foot
L-108-2	No. 8 AWG, 5 kV, L-824, Type C Cable	per linear foot

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical

MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Federal Aviation Administration Standard

FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment

END OF ITEM L-108

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Not Used.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from

slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill may alternatively be used.

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer’s recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall

be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to

the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word “DUCT” or “CONDUIT” on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 4 inches of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 “Excavation and Embankment” except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period’s construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include sodding and seeding as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

L-110-1	1 Way 2-inch Schedule 40 PVC Conduit – Direct Earth Buried in Turf	per linear foot
L-110-2	1 Way 2-inch Schedule 40 PVC Conduit – Direct Earth Buried under Mill/Overlay Pavement	per linear foot
L-110-3	1 Way 2-inch Schedule 40 PVC Conduit – Concrete Encased under Mill/Overlay Pavement	per linear foot
L-110-4	2 Way 2-inch Schedule 40 PVC Conduit - Direct Earth Buried	per linear foot
L-110-5	2 Way 2-inch Schedule 80 HDPE Directional Drill	per linear foot

REFERENCES

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

Advisory Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit - Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 1242	Electrical Intermediate Metal Conduit Steel
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

END OF ITEM L-110

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Item L-115 Electrical Manholes and Junction Structures

DESCRIPTION

115-1.1 This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

115-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications**.** The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section**.** The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from the

date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

115-2.2 Concrete structures. Concrete shall be proportioned, placed, and cured per [Item P-610, Concrete for Miscellaneous Structures]. Cast-in-place concrete structures shall be as shown on the plans.

115-2.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand 100,000 lb aircraft loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

115-2.4 Junction boxes. Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel. If 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Covers shall be 3/8-inch (9-mm) thickness for L-867 and 3/4-inch (19-mm) thickness for L-868. All junction boxes shall be provided with both internal and external ground lugs.

115-2.5 Mortar. The mortar shall be composed of one part of cement and two parts of mortar sand, by volume. The cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C206. Water shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

115-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

115-2.7 Frames and covers. The frames shall conform to one of the following requirements:

a. ASTM A48 Gray iron castings

b. ASTM A47 Malleable iron castings

c. ASTM A27 Steel castings

d. ASTM A283, Grade D Structural steel for grates and frames

e. ASTM A536 Ductile iron castings

f. ASTM A897 Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of 250 psi and maximum load of 100 kips lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word "ELECTRIC" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 Ladders. Not Used.

115-2.9 Reinforcing steel. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.10 Bedding/special backfill. Bedding or special backfill shall be as shown on the plans.

115-2.11 Flowable backfill. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.12 Cable trays. Not Used.

115-2.13 Plastic conduit. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.14 Conduit terminators. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.15 Pulling-in irons. Pulling-in irons shall be manufactured with 7/8-inch (22 mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch (12 mm) diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

115-2.16 Ground rods. Ground rods shall be one piece, copper clad steel**.** The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 10 feet long nor less than 3/4 inch in diameter.

CONSTRUCTION METHODS

115-3.1 Unclassified excavation. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 Concrete structures. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

115-3.3 Precast unit installations. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 Placement and treatment of castings, frames and fittings. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 Installation of ladders. Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

115-3.6 Removal of sheeting and bracing. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches (150 mm) of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

115-3.7 Backfilling. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches (150 mm) in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be

responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

115-3.8 Connection of duct banks. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 Grounding. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches (150 mm) above the floor. The ground rod shall be installed within one foot (30 cm) of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch (100 mm) diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot (30 cm) above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

115-3.10 Cleanup and repair. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 Restoration. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 Inspection. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 Manhole elevation adjustments. Not used.

115-3.14 Duct extension to existing ducts. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering:; sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

L-115-1	Junction Can Plaza - 2 L-867D Base Cans	per each

REFERENCES

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

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/IEEE STD 81 IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime

FAA Engineering Brief (EB)

EB #83	In Pavement Light Fixture Bolts

Mil Spec

MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

END OF ITEM L-115

Item L-125 Installation of Airport Lighting Systems

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in an electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR’s opinion, does not meet the system design and the standards and codes, specified herein.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Concrete. All concrete used in structures must conform to the requirements of Item P-610, Concrete for Miscellaneous Structures.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Retroreflective markers shall be type L-853 and shall conform to

the requirements of AC 150/5345-39.

125-2.7 Taxiway Edge Lights. Taxiway edge lights shall conform to the requirements of FAA AC 150/5345-46, latest edition TYPE L-861T. Taxiway edge fixture lamps shall be LED type with properly sized transformer at the locations indicated on the plans. Taxiway edge lights shall be installed at the locations indicated in the plans in accordance with the details.

125-2.8 Guidance Signs. Guidance Signs shall conform to the requirements of FAA AC 150/5345-44 latest edition TYPE L-858 Y, R, L, and B. Guidance signs shall be of size and type as indicated on the details in the plans with LED type engines. The signs shall be installed at the locations indicated in the plans in accordance with the details with the messages as shown on the sign schedule.

125-2.9 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867, Class 1A, Size shall be as shown on plans. Base cans shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.10 Isolation Transformers. Isolation Transformers shall be Type L-830 , size as required for each installation. Transformer shall conform to AC 150/5345-47.

125-2.11 Constant Current Regulators. Not used.

125-2.17 Basis Of Design. The airfield lighting systems are designed using the below listed maximum fixture wattages. Approved airfield lighting fixtures with higher wattages are permissible provided the Contractor assumes all costs for the redesign of the airfield lighting and necessary power distribution systems and all costs incurred furnishing and installing any additional equipment. In no case shall the Contractor be allowed to reduce the size of the constant current regulators or the power distribution systems.

L-861T 21 W	Taxiway Edge Light - LED (Elevated)		
L-861T 42 VA	Taxiway Edge Light - Incandescent (Elevated)		
L-858Y,R,L - LED			
	Location, Information, Boundary, Destination Mandatory Sign	1 Module	100 VA
		2 Module	100 VA
		3 Module	110 VA
		4 Module	110 VA

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

Require the Contractor to furnish all necessary equipment and appliances for testing the underground cables, counterpoise, and safety ground in accordance with Item L-108, Underground Power Cable for Airports and L-131.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer’s recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

125-3.5 Maintenance Of Airport Lighting Systems. The Contractor shall maintain the airport lighting systems during the various phases of the work as shown on the phasing plan(s) or as directed by the Engineer. The Contractor shall be responsible for all temporary connections in the field or at the regulator necessary for operation of the circuits during construction.

125-3.6 Restoration. After the backfill is completed, the contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. The restoration shall include top soiling, seeding, and mulching. The Contractor shall grade around structures as required to provide positive drainage away from the structure. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacement until final acceptance. All restoration shall be considered incidental to the item for which it applies.

125-3.7 Inspection. Inspect each light fixture, marker, and sign to determine that it is installed correctly, at the proper height, in line with the other fixtures, level, and properly oriented.

Check all fixture, marker, and sign securing screws or bolts to ensure that they have been tightened per manufacturer's recommendations. Use an anti-seize compound on bolts made of stainless steel.

Check each fixture, marker, and sign to determine that the lenses and panels are clean and unscratched.

Check identification numbers for each light fixture and sign to determine that the number at the installation is assigned in the plans or by the Owner's direction.

Check equipment covered by FAA specifications to determine if the manufacturers have supplied certified equipment. Also check equipment for general conformance with the specification requirements.

Check base plates for damage during installation and refinish according to manufacturer's instructions.

METHOD OF MEASUREMENT

125-4.1 Taxiway lights and guidance signs will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR. In-Pavement Light Fixtures reinstalled on existing base cans will be measured by the number installed as completed units in place, ready for operation, and accepted by the RPR.

125-4.2 Measurement for the coordination of re-calibrating the existing Constant Current Regulator will be per lump sum. This will include all work associated with coordinating and

supporting the CCR manufacturer to complete all re-calibration of the CCR, including, but not limited to, fees, site visit expenses, manufacturer escort access to AOA, hardware modifications if directed by the manufacturer, and all other incidentals required in the field necessary to complete this item in accordance with these specifications, installation details shown on the plan drawings, and as directed by the RPR.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete light fixture, guidance sign, installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Taxiway edge light units include fixtures, stems, frangible couplings, base cans, base plates, gaskets, isolation transformers, grounding connections, ground rods, excavation, backfill, restoration, testing, and incidental items required to provide a functioning unit in accordance with the Contract Documents.

Payment will be made at the contract lump sum unit price for coordinating the re-calibration of the existing Constant Current Regulator with the manufacturer ADB Safegate. This price will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item, including all coordination, fees, and site visit expenses required by the CCR manufacturer.

Payment will be made under:

L-125-1	L-861T(L) LED Taxiway Edge Light – Base Mounted in Turf	per each
L-125-2	L-861T(L) LED Taxiway Edge Light – Base Mounted in Mill/Overlay Pavement	per each
L-125-3	Reinstall Existing In-Pavement Light Fixture On New Base Can In Mill/Overlay Pavement	per each
L-125-4	L-858(L) LED Sign, 1-Module on a New Concrete Sign Base	per each
L-125-5	L-858(L) LED Sign, 2-Module on a New Concrete Sign Base	per each
L-125-6	L-858(L) LED Sign, 3-Module on a New Concrete Sign Base	per each
L-125-7	CCR Re-calibration Coordination with ADB-Safegate	per lump sum

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-18 Standards for Airport Sign Systems

AC 150/5340-26 Maintenance of Airport Visual Aid Facilities

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program

Engineering Brief (EB)

EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

ITEM L-131

DEMONSTRATIONS, TESTS AND PERFORMANCE VERIFICATION

DESCRIPTION

131-1.1 GENERAL. This item includes the furnishing of all labor, materials, equipment and services necessary to provide demonstrations, testing and performance verification necessary to show electrical system compliance to these specifications.

DEMONSTRATIONS

131-2.1 CHECK-OUT MEMO. Where required by the plans and specifications, provide manufacturer assistance during the testing, start-up, performance verification, demonstrations and Owner training. Complete the Check-Out Memo contained in Appendix A, Figure 1.

131-2.2 Demonstrate the essential features of the following electrical systems as related to this project:

- Electrical systems control and equipment
- Electrical power equipment
- Panelboards
- Distribution panels
- Main panels, power panels
- Circuit Breakers
- Wiring systems
- Grounding systems
- Low-voltage controls
- Airfield lighting fixtures
- Constant Current Regulators
- Local Control Panel
- Pavement Sensor

131-2.3 The demonstration shall be held upon completion of all systems, including testing, at a date to be agreed upon in writing by the Owner or his designated representative. The demonstration shall be held by the Contractor in the presence of the Owner and the Manufacturer's Representative.

131-2.4 Prior to acceptance of the work, the Contractor shall demonstrate to the Owner, or his designated representative, all features and functions of all systems and shall instruct the Owner in the proper operation of the systems. After testing is completed satisfactorily, each system shall be demonstrated once.

The demonstration shall consist of not less than the following:

a. Point out the actual location of each component of the system and demonstrate its function and its relationship to other components within the system.

b. Demonstrate the electrical systems by actual "start-stop" operation showing how to work controls, how to reset protective devices, how to replace fuses, and what to do in an emergency. Indicate each items relationship to the riser diagrams and drawings.

c. Demonstrate communication, signal, alarm and detection systems by actual operation of the systems and show how to reset signal, alarm and detection devices.

The Contractor shall furnish the necessary trained personnel to perform the demonstration and instructions, and shall arrange to have the manufacturer's representatives present to assist with the demonstrations.

All functional and operational testing of protective interlocking, automatic controls, instrumentation, alarm systems, and all other field testing of the main systems will be completed before the systems are demonstrated.

131-2.5 Submit six (6) copies of the Performance Verification and Demonstration to Owner Form (Appendix A, Figure 2), signed by the Contractor, subcontractor and Owner and insert one copy in each Operation and Maintenance Manual and the original shall be inserted in the Project Closeout Documentation Manual.

TESTS AND PERFORMANCE

131-3.1 TESTS AND PERFORMANCE VERIFICATION. Operate system for a 3-day period. Do performance verification work as required to show that the system is operating correctly in accordance with design. Supply instruments required to read data. Adjust system to operate at the required performance levels. Tabulate data for submission. Submit data on 8-1/2-inch x 11-inch sheets with time and name of checker. Where specific performance verification information is called for in the specifications, use copies of the sheets provided for recording readings. Data shall be submitted and approved before Check-Out Memos are signed or a request for final inspection is made. Submit data in Operation and Maintenance Manuals.

At completion of construction after all performance verification and testing information has been gathered, submitted, and approved, provide one copy of this information to the Manufacturer's representative of the equipment. Work required under this section shall include having the representative examine the performance verification information, check the equipment in the field while it is operating, and sign a Check-Out Memo for a record. Submit six (6) copies of the Check-Out Memo on each major item of equipment. Approved memos shall be inserted in each Operation and Maintenance Manual with the performance verification information. Memos shall be submitted and approved before instruction to Owner or a request for final inspection.

131-3.2 TESTS. After cables are in place, but before being connected to devices and equipment, the system shall be tested for shorts, opens, intentional and unintentional grounds by means of an

approved type of "megger." Airfield lighting cables shall be tested in accordance with Item L-108 Installation of Underground Cable for Airports.

The tests shall be performed and recorded in the presence of the Engineer and the Owner and the test results shall be placed in the Operation and Maintenance Manuals. All wires in conduit that are shorted or unintentionally grounded shall be replaced.

Take readings of voltage and amperage at building main disconnect switch and at main for each panel, at primary side of each lighting transformer and at the end of the longest branch circuit at each panel. The above readings shall be taken (1) “no load” conditions and (2) at “full load” conditions with all equipment using electricity.

The resistance between ground and absolute earth shall be measured by the Contractor before equipment is placed in operation. Testing shall be performed on all ground rod installations before connecting the grounding conductor. The resistance between each ground rod and absolute earth shall not exceed twenty-five (25) ohms. Testing shall be three (3) point method in accordance with IEEE recommended practice and witnessed by the Engineer and Owner. Record data on the Ground Test Information form contained in Appendix A, Figure 3. All ground rods shall be tested.

Perform such tests as required by authorities having jurisdiction over the site, or other tests/inspections as required by other sections of this specification.

There are no approved "repair" procedures for items that have failed testing other than complete replacement. Any other corrective measures shall be approved by the Engineer. The addition of ground rod sections to the ground rods shall be considered replacement for this item.

131-3.3 CORRECTION OF ERRORS. The Contractor shall immediately correct any errors or omissions in his work which are discovered during testing. This shall include but not be limited to, improper phasing resulting in reverse rotation, misinterpretations, incomplete grounding, damaged equipment or materials, or incomplete work the Contractor has already verified as being complete. The Contractor shall immediately replace, repair, or complete these errors and omissions as soon as they are brought to his attention, even if this requires disruption of his scheduled construction activities or work on an overtime basis. Failure to take immediate action or an excessive number of errors or omissions shall make the Contractor liable for the time lost by the Owner's operating forces, and any other personnel.

METHOD OF MEASUREMENT

131-4.1 The items described in this section are incidental to other sections and shall not be measured for payment.

BASIS OF PAYMENT

131-5.1 No direct payment shall be made for the work described in this section. The work described in this section is incidental to other items and shall be paid for in the respective bid item

of which it is a component part.

CHECK-OUT MEMO

This form shall be completed and a copy provided to the Owner at the Owner's Performance Verification and Demonstration meeting. A copy shall also be included in the specification section of the O & M Manual for the equipment checked.

Project Name: Taxiway F and G Rehabilitation for the Fayetteville Regional Airport (FAY)
Type of Equipment Checked: _____
Equipment Number: _____
Name of Manufacturer: _____

Signature below by the manufacturer's authorized representative signifies that the equipment has been satisfactorily tested and checked out on the job by the manufacturer.

1. The attached Test Data and Performance Verification information was used to evaluate the equipment installation and operation.

2. The equipment is properly installed, has been tested by the manufacturer's authorized representative, and is operating satisfactorily in accordance with all requirements, except for items noted below.*

3. Written operating and maintenance information has been presented to the Contractor, and gone over with him in detail.

4. Sufficient copies of all applicable operating and maintenance information, parts lists, lubrication checklists, and warranties have been furnished to the Contractor for insertion in the Operating and Maintenance Manuals.

Checked By: _____
(Print or Type Name of Manufacturer's Representative)

_____
(Address and Phone No. of Representative)

_____
(Signature and Title of Representative)

_____
(Date Checked)

Witnessed By: _____
(Signature and Title of Contractor Representative)

* Exceptions noted at time of check-out (use additional page if necessary):

APPENDIX A, FIGURE 1

PERFORMANCE VERIFICATION AND DEMONSTRATION TO OWNER

This form verifies that the Owner has been given a demonstration of the proper operation on the equipment or systems noted below:

Project Name: Taxiway F and G Rehabilitation for the Fayetteville Regional Airport (FAY)
Specification Division Number & Name: _____
Equipment/System Demonstrated: _____

Along with a complete demonstration of the equipment/system, these items have been reviewed at this demonstration and shall be included in the Operating and Maintenance Manuals, under the appropriate specification section:

1) Written operating instructions.
2) Test data and performance verification information as required by the installer and/or manufacturer.
3) Maintenance information published by manufacturer or equipment.
4) Check-out Memo signed by manufacturer's representative.
5) Printed warranties by manufacturer of equipment.
6) Explanation of the warranty/guarantee on the system.
7) Prints showing actual "As Built" conditions.

_____
(Name of Contractor)

_____
(Signature, Title, Date)

_____
(Name of Subcontractor)

_____
(Signature, Title, Date)

Demonstration of the system/equipment in operation and of the maintenance procedures has been successfully completed.

OWNER

_____
(Signature, Date)

_____
(Owner's Department)

APPENDIX A, FIGURE 2

GROUND TEST INFORMATION

GROUND LOCATION:_____

_____

PRIOR TO CONNECTION TO SYSTEM:

GROUND:_____ (OHMS)

WEATHER CONDITIONS FOR PREVIOUS WEEK:_____

_____

AFTER CONNECTION TO SYSTEM:

GROUND:_____ (OHMS)

CONTRACTOR'S REPRESENTATIVE:_____

_____

DATE:_____

APPENDIX A, FIGURE 3

CABLE INSULATION RESISTANCE TEST RECORD

Circuit Description:_____

_____

_____

Date:_____ Time:_____

Phase A to Ground _____Megohms

Phase B to Ground _____Megohms

Phase C to Ground _____Megohms

Neutral to Ground _____Megohms

Phase A to B _____Megohms Phase A to Neutral _____Megohms

Phase A to C _____Megohms Phase B to Neutral _____Megohms

Phase B to C _____Megohms Phase C to Neutral _____Megohms

Weather Conditions:_____

_____

Temperature:_____

Circuit Condition Prior to Test:_____

_____

Tested By:_____ Date:_____

Witnessed By:_____

Owner's Authorized Representative:_____

Date:_____

APPENDIX A, FIGURE 4

END OF ITEM L-131

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Appendix A – Construction Safety and Phasing Plan

RS&H

April 1, 2026

Construction Safety and Phasing Plan (CSPP) Bidding Documents

Rehabilitation of Taxiway Foxtrot & Golf

April 1, 2026
Fayetteville, North Carolina
RS&H No.: 1003-1830-005

Prepared by RS&H, Inc.

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1 DEFINITION OF TERMS

Term	Definition
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 oeaaa.faa.gov.) The form may be downloaded at http://www.faa.gov/airports/resources/forms/, or filed electronically at: https://oeaaa.faa.gov.
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/.
AC	Advisory Circular
ACRC	Aircraft Reference Code
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
Airport Operations Personnel	FAY Staff that are directly responsible for the airfield operations and well-being of the AOA. Airport Operations Department is located in the Airport Operations Center. Deontae Watson and Station 10
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Airport Operations Area. Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runways, taxiways, or aprons.
ARFF	Aircraft Rescue and Fire Fighting
ARC	Airfield Rehabilitation Committee
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
ATCT	Air Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization

Term	Definition
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR Part 139, Certification of Airports.
CFR	Code of Federal Regulations
Construction	The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
Contractor	The person or company that undertakes the contract to provide materials and labor to perform the project.
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
Engineer	Engineer of Record – also working for RS&H Inc.
FAA	Federal Aviation Administration
FOD	Foreign Object Debris
HAZMAT	Hazardous Materials
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LD	Liquidated Damages
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
NTP	Notice To Proceed. Effective date for start of construction contract.
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
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
OSHA	Occupational Safety and Health Administration
Owner	The City of Fayetteville
P&R	Planning and Requirements Group
PAPI	Precision Approach Path Indicators
PCI	Pavement Condition Index
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicators
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RE/RPR	Resident Engineer/Resident Project Representative
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
RS&H	RS&H, Inc. Engineering designer of record. Referred to as “Engineer”.
SIDA	Security Identification Display Area
SMGCS	Surface Movement Guidance and Control System
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
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 Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicators
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicators (PAPI), visual approach slope indicators (VASI), and pulse light approach slope indicators (PLASI).
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Radio Range

2 PURPOSE

Aviation safety is the primary consideration at airports, especially during construction. The Fayetteville Regional Airport (FAY) Construction Safety and Phasing Plan (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 Personnel. These

documents identify all aspects of the construction project that pose a potential safety hazard to aircraft and outline respective mitigation procedures for each hazard.

The CSPP sets forth benchmarks and requirements for the project to help ensure the highest levels of safety, security and efficiency at the airport at the time of construction. Guideline requirements for the CSPP are developed from the Federal Aviation Administration Advisory Circular (FAA AC) 150/5370-2F Operational Safety on Airports during Construction.

The CSPP is a standalone document, written to correspond and comply with the safety and security requirements set forth in FAA AC 150/5370-2F and local codes requirements. The CSPP is to be used by all personnel involved in the project and covers the actions of not only the construction personnel and equipment, but also the action of inspection personnel and airport staff.

This document has been developed to minimize interruptions to airport operations, reduce construction costs, and maximize the performance and safety of construction activity. Strict adherence to the provisions of the CSPP by all personnel assigned to or visiting the construction site is mandatory for AIP funded construction projects. The Contractor shall be required to submit a SPCD to the Fayetteville Regional Airport staff, describing how the Contractor will comply with the requirements set forth in this CSPP. The SPCD must be submitted to the Engineer and approved prior to issuance of the Notice to Proceed.

In the event the Contractor's activities are found in non-compliance with the provisions of the CSPP or the SPCD, the Engineer or RPR will direct the Contractor, in writing, to immediately cease those operations in violation. In addition, a safety meeting will be conducted for the purpose of reviewing those provisions in the CSPP/SPCD which were violated. The Contractor will not be allowed to resume any construction operations until conclusion of the safety meeting and all corrective actions required by the Contractor have been implemented.

3 SCOPE

Fayetteville Regional Airport engaged the services of RS&H Architects-Engineers-Planners, Inc. to design the Rehabilitation of Taxiway Foxtrot and Golf. This will include updates to the taxiway features consistent with the latest design standards from the FAA AC) 150/5300-13B Airport Design, Change 1. Most of the rehabilitation will consist of Milling and overlaying asphalt for the existing Taxiway Foxtrot and Golf pavement.

The scope includes the following elements:

- Mill and Overlay of Taxiway Foxtrot from Runway 4-22 connector to the Runway 28 connector and Taxiway Golf from Taxiway Foxtrot to Runway 10-28 connector.

- Removal of Taxiway Foxtrot shoulder near the Runway 28 Connector
- Airfield Electrical Improvements
- New Taxiway Designation Signage
- Pavement Marking
- Minimal Safety Area Grading, Seeding, and Sodding
- Millings vehicle service road placement

Necessary construction locations, activities, and associated costs have been identified, and their impact on Airport Operations has been assessed. The impact of work on the Airport Operations Areas (AOA) is graphically shown in the Contractor Phasing Plan, as provided in **Appendix E**. These exhibits will be made part of the drawing set issued to the Contractor for bidding and construction.

4 PLAN REQUIREMENTS

4.1 Overview

Aviation safety is the primary consideration at airports, especially during construction. The Contractor's Construction Safety and Phasing Plan (CSPP) and the Contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with the Airport. 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 all information necessary for Airport Operations Personnel to conduct airfield inspections and direct the Contractor to expeditiously correct unsafe conditions during construction. All aviation safety provisions included within the project's drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

4.2 Submit an SPCD

The contractor shall submit the SPCD to the engineer for approval to be issued prior to the Notice to Proceed.

4.3 Coordination

4.3.1 Progress Meetings

Kickoff Meeting: A design kickoff meeting was scheduled to identify the limits of the project. This meeting included initial concepts of pavement sections, geometry, and developed a framework for project design delivery to the Airport.

Client Design Progress Meeting: Design meetings were periodically held to provide updates on the progress of the design and to answer questions requiring feedback from the Airport. Several site visits were performed in coordination with Airport Operations Personnel to identify survey elements and understand electrical requirements outside the original project limits.

Pre-Bid Conference: The RS&H design team, in conjunction with the City of Fayetteville Team, will conduct a pre-bid conference, between the potential contractors, the design team, and the City of Fayetteville, to help clarify and explain scope of work, construction requirements and limitations, DBE plan, pre-qualification process, CSPP and SPCD requirements, and safety measures required by the contract. The meeting shall be held prior to the bid opening date. Typical agenda items included for this meeting include the following:

- Scope of work
- Phasing Requirements
- Contractor Staging Area, Access, and Haul Routes (Requirements and Limitations)
- Safety Requirements (CSPP and SPCD)
- Construction Duration and Liquidated Damages
- Construction Means and Methods
- DBE Goals and Requirements
- Insurance and Contract Requirements
- Quality Assurance and Quality Control Testing Requirements

The pre-bid conference primarily will be to cover relevant information concerning the Contractor's requirements for developing and submitting a SPCD for review and approval. This will include both general and specific elements required in the SPCD. In addition, information on how the Contractor shall format the document to illustrate their plans for compliance with those provisions detailed within this CSPP will also be provided.

Any changes or modifications recommended during the conference will be included in an addendum to the bidding documents. A copy will be furnished to each participant following the pre-bid meeting.

Pre-Construction Conference: A pre-construction conference shall be convened and be conducted by the RS&H design team and City of Fayetteville staff to discuss operational safety, testing, quality control, quality acceptance, security, communications, safety, labor requirements, environmental factors, and other issues. This meeting, among all parties affected by the construction, shall assist in a better understanding of potential problems and possible solutions for the course of the performance of this contract.

The pre-construction conference shall be conducted as soon as practicable after the contract has been awarded and before issuance of the notice to proceed. Meeting minutes will be prepared and copies of the proceedings, containing all items discussed, including responses to questions, will be made available to each of the participants, upon request.

The expected participants for this meeting shall include, but are not limited to, the following parties:

- Resident Engineer.
- Airport management. (Project Manager, Facilities Engineering, Operations, Communications, Maintenance, Airport Security, etc…)
- Construction Project Manager
- Testing laboratory representative.
- Contractor and subcontractor(s).
- Contractor's project superintendent.
- Contractor's project clerk.
- Airport stakeholders potentially impacted by the proposed construction.
- Utility companies affected by the proposed construction.
- Federal, state, or local agencies affected by the proposed construction.
- Representative of FAA Airports regional or field office and RDU Air Traffic Control Tower (FAA ATCT).

The Engineer will prepare an agenda prior to the pre-construction conference. This will include but is not limited to:

- Project Scope
- Project phasing and critical dates
- Relationship between the Airport representative and the Contractor.
- Relationship between the FAA and the sponsor.
- Identification of the Contractor's superintendent and a discussion of his/her authority and responsibilities.
- Designation of sponsor representative responsible for notifying the Flight Service Station serving the airport of the proposed start and completion dates of construction or of any circumstances requiring a Notice to Airmen (NOTAM). Planned coordination (Airport Operations Department), control and communications needed for those closures and

crossings identified for this project are discussed in detail in Section 4.11 Notification of Construction Activities.

- Scheduling of work and the need to perform certain items at various stages of the project, including operational safety concerns that might arise because of the proposed work.
- Work required prior to Notice to Proceed (NTP)
- NTP date.
- Safety during construction, including the responsibility for marking and lighting of closed and hazardous areas. See AC 150/5370-2F Operational Safety on Airports During Construction and AC 150/5340-1L, Standards for Airport Markings, current edition, for detailed information.
- Security requirements.
- The need for continuing vigilance for potential or existing hazards relative to any of the items associated with construction operations on an active or closed airfield surface.
- CSPP and SPCD Requirements.
- Schedule of work and the need to perform specific work at various times during the project; milestones.
- Taxiway and Runway Closures.
- Marking and Lighting Requirements

Contractor Progress Meetings: Weekly construction meetings will be held to discuss work progress and to address current or potential security and safety concerns. These meetings may be adjusted to a day-to-day basis as necessary for specific work items. Operational safety and security will be a standing agenda item for discussion during these weekly/daily construction progress meetings. The Contractor shall be held responsible for coordinating any changes that are documented during these meetings.

Airport staff, RS&H, the RPR, the Contractor, Contractor's superintendent, subcontractors (as needed), materials testing representative, and any impacted tenants (if any) shall attend all Contractor Progress Meetings.

The Contractor will prepare an agenda prior to each construction meeting, including but not limited to the following items:

- Schedule (Work to date and 2-4 week look ahead)
- Safety and Security
- Operational impacts

- Submittals
- RFI's
- Change Orders
- Pay Requests
- Reporting on contract time remaining and weather delays
- Runway and/or Taxiway Closures

Prior to the starting work in a new area, the Contractor will include the following additional items in the construction meetings:

- Operational Considerations
- Any additional safety and security required by the new phase
- Runway and/or Taxiway Closures for the new phase

4.3.2 Scope or Schedule Changes

Changes in the scope and/or duration of the project may necessitate revisions to the CSPP. The FAA Airports District Office and North Carolina Department of Transportation's Division of Aviation (DOA) will be promptly notified of any proposed changes to this CSPP. Changes to this document require review and approval by the RPR, FAA, and DOA prior to implementation. In addition, changes may require coordination with local and federal government agencies (i.e. TSA, NCDEQ, etc.)

4.3.3 FAA Air Traffic Organization (ATO) Coordination

Coordination with FAA ATO will be made following final design and before beginning construction. The Engineer will assist Airport staff in notifying the ATO of airway facility shutdowns and restarts of Taxiways F, G, M, N, Runway 10-28, and 4-22 that are scheduled to be temporarily closed during construction. The Contractor will notify the Engineer and FAY staff following the procedures outlined in the plans in **Appendix E**. Prior to re-opening, an airfield inspection must be coordinated and scheduled through Airport staff in advance of the intended opening of the affected taxiway.

4.4 Phasing

Construction phasing for this project has been coordinated with FAY staff, FAA ATCT, and airport stakeholders. The sequenced construction phases established in this CSPP have been incorporated into the project design and are reflected in the contract drawings and specifications.

4.4.1 Phasing Elements

The sequence of construction for this project has been phased to maintain aircraft operations at an acceptable level of efficiency for the duration of this contract. General elements of sequencing and phasing are as follows:

- *Areas Closed to Aircraft Operations:* The schedule for closure of runways and taxiways are defined within the phasing notes and plans within **Appendix E**. All closures shall be coordinated by the Contractor to FAY staff, Engineer, and FAA ATCT Manager.
- *Duration of Closures:* The schedule for closure of the runway/taxiway and connectors is defined within the phasing notes and plans within **Appendix E**.
- *Taxi Routes:* Taxiway or runway closures that alter aircraft taxi routes shall be communicated by the Contractor to FAY staff, Engineer, and FAA ATCT Manager at least 48 hours in advance of the requested closure period.
- *Aircraft Rescue and Fire Fighting (ARFF) Access Routes*: Taxiway or runway closures that alter ARFF Access routes shall be coordinated by the Contractor and Engineer prior to any action with FAY staff and FAA ATCT Manager. Emergency ARFF access in and around the construction site shall be maintained by the Contractor for the duration of this project. The Contractor must prominently mark and barricade all open trenches and excavations within the construction site. Barricades must be adequately illuminated with red lights during hours of restricted visibility or darkness.
- *Construction Staging Areas:* The location of the construction staging area is shown on the Contractor Access Plan as depicted in **Appendix E**. Construction staging areas and contractor employee parking areas are to remain outside of all runway and taxiway object free areas, and NAVAID critical areas. All staged equipment and structures shall remain below the active FAA Part 77 Imaginary Surfaces identified in **Appendix E**. The Contractor shall submit 7460 documents to the FAA ADO prior to beginning construction activities and shall remain within those defined limits without prior authorization from the FAA ADO.
- *Construction Access and Haul Routes:* The location of the contractor access route is shown on the Contractor Access Plan as depicted in **Appendix E**. The Contractor shall always maintain applicable control along contractor haul routes for both safety and security. This is especially critical at locations that require the Contractor to cross or move through the active AOA. Refer to Section 4.7.2 Vehicle and Pedestrian Operations and Section 4.17 Marking and Signs for Access Routes, and Section 4.19 Protection of Runway and Taxiway Safety Areas of this document for additional information.
- *Impacts to NAVAIDS:* No NAVAID impacts other than possible temporary power outages for circuitry are anticipated during the duration of this project.

- *Lighting and Marking Changes*: Lighting and marking changes for the airfield are required as part of this project. Taxiway edge lights will be installed concurrently with mill & overlay operations. Temporary markings will be installed to allow the asphalt to cure for a 30 day period. At which time permanent markings will conclude the majority of work associated with this project.
- *Available Runway Length*: All runways, when open, will be available for use during the duration of this project. Daytime and night-time closure coordination will be the responsibility of the Contractor in coordination with FAY staff, the Engineer, and the FAA ATCT.
- *Declared Distances*: No declared distances are required for this project.
- *Required Hazard Marking and Lighting*: The Contractor shall reference Section 4.17 Marking and Signs for Access Routes; Section 4.18 Hazard Marking and Lighting; and Section 4.19 Protection of Runway and Taxiway Safety Areas of this document for additional information.
- *Lead Times for Required Notifications:* The Contractor shall provide a minimum of 48 hours advance notice of any planned closures or other activities that could impact or delay aircraft operations. Lead times for other construction activities shall be initially established at the pre-construction meeting or as noted on the plans.

4.4.2 General Phasing Requirements

1. The intent of the phasing plan is to minimize the impact of construction on the operation of the airport and its tenants. The Contractor shall expediently construct the project in consecutive phases as outlined in the plans unless otherwise approved. The Contractor may propose written alterations to the phasing plan if beneficial to the Owner. The Owner or Engineer must approve any revisions to the phasing plans prior to executing.
2. Refer to detailed phasing plans for specific information for each phase in **Appendix E**.
3. The Contractor shall be given a defined number of consecutive calendar days to complete each phase of work as specified in the contract documents and plans. If the Contractor does not complete the construction within the time allotted in the contract documents, FAY may elect to assess liquidated damages as defined unless the contract time is extended in accordance with the contract documents.
4. The Contractor shall, at all times, coordinate their work efforts with the Engineer. If any delays or changes in the work arise during construction, the Contractor shall immediately notify the Engineer. The Contractor is expected to take immediate action to correct or resolve the cause for said delay.
5. Any situation within the work zone or project scope that, in the opinion of the Engineer, constitutes a hazard to airport operations or safety shall be immediately curtailed until corrective action is taken. The Contractor will not be granted additional time or compensation for delays resulting from work zone violations.

6. Contractor shall furnish, install, and maintain all barricades and temporary or interim markings for the duration of the project.
7. The Contractor shall make necessary temporary electrical power connections to keep portions of the active taxiways accessible and delineated by either deactivation and/or covering of lights and signs.
8. Construction access for all phases will be via Gate 19 along the existing Doc Bennett Road, south of Runway 10-28.

4.4.3 Phase Descriptions

Phasing closures and impacts to airport operations are listed for each phase in Section 4.5.1 Identification of Affected Areas of this document. Phase work associated with this project includes:

4.4.3.1 Phase 1

Work in Phase 1 includes the following:

- Pavement milled and overlayed from the Taxiway F RSA at Runway 4-22 to the Runway 10-28 RSA.
- Pavement milled and overlayed from the Taxiway F and G intersection to the Runway 10-28 RSA on Taxiway G.
- Taxiway F shoulder pavement, surface drainage, and vehicle service road removal
- Shoulder grading
- Taxiway edge lighting replacement
- Temporary markings
- Centerline Marking Removal

4.4.3.2 Phase 2

Phase 2 work will be completed concurrently with Phase 1. Work in Phase 2 includes the following activities:

- Pavement milled and overlayed inside the RSA of Runway 10-28
- Taxiway edge lighting replacement
- Temporary markings

4.4.3.3 Phase 3

Phase 3 work will be completed concurrently with Phase 1. Work in Phase 3 includes generally the following activities:

- Pavement milled and overlayed inside the RSA of Runway 4-22
- Electrical Vault and Homerun work
- Taxiway edge lighting

- Temporary markings

*4.4.3.4 **Pavement Curing Period***

A minimum of 30 days is required for the pavement to cure to apply permanent pavement markings.

4.4.3.5 Phase 4

Phase 4 includes the permanent pavement marking application on Taxiway F and G. Also included will be the as-built pavement marking survey.

4.4.4 Construction Safety Drawings

Plan sheets specifically indicating operational safety procedures and methods in areas affected by construction activities associated with this project (by phase) have been provided with this CSPP and incorporated into the project drawing set in **Appendix E**.

4.5 Areas and Operations Affected by the Construction Activity

Runways, taxiways and other airfield surfaces shall remain in use by aircraft or airport support vehicles to the maximum extent possible without compromising safety. These affected areas are graphically illustrated in the attached exhibits in **Appendix E**.

4.5.1 Identification of Affected Areas

Impacts to Airport operations are shown in the following **Table 4-1**.

Table 4-1
Airport Operations Effects

Project	Rehabilitation of Taxiways Foxtrot and Golf Project	
Phase	**Phase I**	
Scope of Work	Mill and Overlay Taxiway F and G outside both runway RSAs. Refer to Section 4.4.3 for additional work elements.	
Operational Requirements	**Normal (Existing)**	**Phase I (Anticipated)**
Taxiway F	ADG II	Closed from Runway 4-22 to Runway 10-28
Taxiway G	ADG II	Closed
Runway 4-22	ADG III	ADG III, temporary night closure 12:00 AM to 5:30 AM at project beginning for centerline removal

Runway 10-28	ADG II	ADG II, temporary day closure at project beginning for centerline removal
Phase	**Phase II**	
Scope of Work	Mill and Overlay of Taxiway G and F Connector Inside Runway 10-28 RSA. Refer to Section 4.4.3 for additional work elements.	
Operational Requirements	**Normal (Existing)**	**Phase II (Anticipated)**
Taxiway F	ADG II	Closed from Runway 4-22 to Runway 10-28
Taxiway G	ADG II	Closed
Runway 4-22	ADG III	ADG III
Runway 10-28	ADG II	Closed
Taxiway N	ADG II	Closed
Phase	**Phase III**	
Scope of Work	Mill and Overlay of Taxiway F Inside Runway 4-22 RSA. Refer to Section 4.4.3 for additional work elements.	
Operational Requirements	**Normal (Existing)**	**Phase III (Anticipated)**
Taxiway F	ADG II	Closed from Runway 4-22 to Runway 10-28
Taxiway G	ADG II	Closed
Runway 4-22	ADG III	Temporary Night Closures from 12:00 AM to 5:30 AM
Runway 10-28	ADG II	ADG II
Phase	**Asphalt Curing Period**	
Scope of Work	30 Day Period for the asphalt to cure. Refer to Section 4.4.3 for additional work elements.	
Operational Requirements	**Normal (Existing)**	**Curing Period (Anticipated)**
Taxiway F	ADG II	ADG II

Taxiway G	ADG II	ADG II
Runway 4-22	ADG III	ADG III
Runway 10-28	ADG II	ADG II
Phase	**Phase IV**	
Scope of Work	Permanent Pavement Markings and as-built survey.	
Operational Requirements	**Normal (Existing)**	**Phase IV (Anticipated)**
Taxiway F	ADG II	Closed
Taxiway G	ADG II	Closed
Runway 4-22	ADG III	Temporary Night Closures from 12:00 AM to 5:30 AM
Runway 10-28	ADG II	Temporary Day Closures
Taxiway N	ADG II	Closed During 10-28 Closure

Reference **Appendix E**, for graphical identification of areas affected by construction operations. Of particular concern are the following:

- *Closing, or partial closing, of runways, and taxiways*: Runway 4-22, Runway 10-28, Taxiway F, G, and N will all require full or partial closures. Refer to **Table 4-1** for specific closure details.
- *Closing of ARFF access routes*: The Contractor is required to maintain access in and around the project work area for all ARFF vehicles.
- *Closing of access routes used by airport and airline support vehicles*: While the existing Vehicle Service Road (VSR) may be used as a construction route, the Contractor may not obstruct access for airport and airline support vehicles.
- *Interruption of utilities, including water supplies for firefighting:* No utility impacts are expected to be encountered by this project. It is the Contractor's responsibility to locate existing utilities and confirm no impacts are expected.
- Approach/Departure surfaces affected by heights of objects: Equipment shall not exceed 25 feet in height.

- *Construction areas:* These areas include the project work area, storage/stockpile areas, staging areas, and contractor haul routes near active airfield surfaces. These areas are identified in **Appendix E.**

4.5.2 Mitigation of Effects

This CSPP has established specific requirements and operational procedures necessary to maintain the safety and efficiency of FAY airport operations during construction. All coordination pertaining to FAY Airport Operations during construction will be through the Airport Operations Personnel. All NOTAM requests will be reviewed by the Engineer and submitted to the Airport Operations Personnel for issuance.

*4.5.2.1 **Temporary Changes to Runway and/or Taxiway Operations***

The affected taxiways identified in the previous section for reduced access or identified as being closed entirely to aircraft traffic, will be barricaded by the use of low profile, lighted barricades placed as shown in the exhibits provided in **Appendix E**. In addition, required NOTAM's shall be issued on the various temporary changes to aircraft access through the affected areas.

*4.5.2.2 **Detours for ARFF and Other Airport Vehicles***

The project work site shall remain open to all ARFF vehicles in emergency situations. The Contractor is required to maintain access in and around the project work area for all ARFF vehicles. Proper routing of this traffic will be effectively communicated to all supervisory personnel involved in the construction project.

*4.5.2.3 **Maintenance of Essential Utilities***

Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the Contractor shall locate and/or arrange for the location of all the underground utilities. When an underground cable or utility is damaged due to the Contractor's negligence the Contractor shall immediately repair the affected cable or utility at his/her own expense. Full coordination between the Engineer, Contractor, and Airport Operations Personnel will be exercised to ensure that all airport power and control cables are fully protected prior to any excavation. Locations of cabling and other underground utilities will be marked prior to beginning excavation.

*4.5.2.4 **Temporary Changes to Air Traffic Control Procedures***

Changes to air traffic control procedures must be coordinated with the Airport Operations Personnel, Engineer, and FAA ATCT Manager.

4.6 Protection of Navigation Aids (NAVAIDS)

The Contractor shall protect all NAVAIDS during construction activities. This includes and not limited to protection of landing lighting systems, guidance and approach systems, etc… Construction activities and materials/equipment storage near a NAVAID must not obstruct access

to the equipment and instruments for maintenance. The Contractor is required to submit a 7460-1 form for construction vehicles operating near FAA NAVAIDs.

4.7 Contractor Access

All construction personnel shall be regularly reminded during contractor daily construction meetings that an aircraft always has "Right of Way". This CSPP details those areas to which the Contractor must have access, and how contractor personnel will access those project work areas.

4.7.1 Location of Stockpiled Construction Materials

Stockpiled materials and equipment storage are not permitted within the Runway Safety Area (RSA), Taxiway Safety Area (TSA), Obstacle Free Zone (OFZ), Object Free Area (OFA) of an operational runway or taxiway, critical area of an electronic NAVAID, or blocking a visual NAVAID. Stockpiled materials and equipment adjacent to these areas are to be prominently marked and lighted during hours of restricted visibility or darkness. Stockpiled material shall be constrained in a manner to prevent movement resulting from either aircraft jet blast or wind conditions in excess of ten miles per hour. In addition, stockpiled material shall have silt fence located around the material to prevent Foreign Object Debris (FOD) from moving onto the airfield pavements or polluting watercourses.

Open trenches exceeding 3 inches in depth and 5 inches in width or stockpiled material are not permitted within the limits of safety areas of operational runways or taxiways. Stockpiled material shall not be permitted within the protected areas of the runways or allowed to penetrate any of the protected airspace.

In addition, unclassified excavation materials shall be removed and legally disposed of off airport property and not stockpiled on airport property. All demolished pavement materials will either be placed or stockpiled at the direction of Airport staff.

Refer to Section 4.9 Foreign Object Debris (FOD) Management, Section 4.10 Hazardous Materials (HAZMAT) Management, and Section 4.19 Protection of Runway and Taxiway Safety Areas for additional information regarding stockpile management.

4.7.2 Vehicle and Pedestrian Operations

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 Operations Personnel will coordinate requirements for vehicle operations with the affected airport tenants, and other contractors. This project does not provide pedestrian access to the project site. The contractor shall access the site by vehicle only. Specific vehicle access routes can be found in **Appendix E** and the requirements for this project are as follows:

1. All construction vehicles and personnel shall be restricted to the immediate work areas specified by the contract. These areas include the haul route into the work area, the designated contractor staging area and the area under construction. Use of alternate haul routes or staging areas by the Contractor shall not be permitted without prior notification and approval by the Engineer and Airport staff.
2. Access or haul routes used by Contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to Airport Operations Personnel. Construction traffic must remain on the haul road, never straying from the approved paths. Maintenance and upkeep of the haul roads are the responsibility of the Contractor. Application of water on dirt or gravel haul routes must be provided as often as necessary. Haul roads in any airport traffic areas must be especially monitored for dust and debris to prevent any potential FOD situations. The Contractor is responsible for any damage caused by construction traffic on the haul roads, regardless of whether in an approved or un-approved traffic area. Following construction completion, the Contractor shall grade, reseed, clean or otherwise restore the haul route areas to their original conditions prior to construction activities. Special attention must be given 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 do not interfere with NAVAIDs or approach surfaces of operational runways. Work necessary in maintaining the haul roads and compliance with safety and security requirements is considered incidental to the project, and therefore, shall not be directly paid for.
3. Contractor parking and equipment staging areas have been identified in **Appendix E**. Contractor parking must remain in the designated areas. Alternative arrangements shall be coordinated with the Engineer and Airport staff.
4. Contractor must service all construction vehicles within the limits of the project work area or the Contractor staging area. Parked construction vehicles must be outside the OFZ and never in the safety area of an active runway or taxiway. Inactive equipment must not be parked on closed taxiways or runways. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted and have an approval from Airport staff. Employees shall 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 Engineer 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).

5. Vehicles entering the AOA, prior to construction, shall have their tires inspected for FOD. The inspections shall consist of a complete walk around the vehicle to check the tires for FOD and remove any loose materials.
6. At no time will vehicles or personnel enter portions of the secure AOA outside the contract area unless permitted and accompanied by an airport approved escort.
7. All construction-related activity taking place within the movement area of the AOA requires the presence of authorized personnel that have passed the approved FAY airport movement and escort training and having radio communication with the FAA control tower unless prior approval is obtained from Airport Operations Personnel. Spotters and/or flaggers are not expected for areas requiring access outside Taxiway F and G. The Contractor should coordinate the need for spotters and/or flagger use with the Engineer and Airport Operations Staff. Spotters and/or flaggers will always maintain direct radio contact with FAA ATCT at all times. Any command or instruction given by the control tower, the flaggers, or spotters shall be immediately obeyed by the operator. All personnel acting in the capacity of spotter and/or flagger, shall be badged by the airport and have successfully passed the airport provided training course. The Contractor shall provide all necessary equipment for the spotters and/or flaggers, including but not limited to, airport approved 2-way air communication radios, stop signs, flags, weather protection and other equipment deemed necessary to perform the crossing responsibilities.
8. Contractor personnel operating within the AOA, shall maintain two-way radio communications with air traffic control and monitoring air traffic control frequencies at all times.
9. All vehicles operating on the airport and in the general vicinity of the safety area or in aircraft movement areas must be marked with flashing yellow/amber beacons or orange and white flags during daylight hours. In addition, the vehicles and equipment will have permanent company name and/or appropriate identifying symbols at a minimum of 8-inch block-type characters of contrasting color that are easily legible. During hours of darkness or low visibility they shall be marked with at least flashing yellow/amber beacons.
10. Beacons and flags must be maintained to standards and in good working and operational condition. Beacons must be located on the uppermost part of the vehicle structure, visible from any direction, and flash 75 +/- 15 flashes per minute. Flags shall be 3’ by 3’ with alternating 1’ by 1’ international orange and white squares and shall be replaced by the Contractor if they become faded, discolored, or ragged as determined by the RPR.
11. When any vehicle, other than those having prior approval from Airport staff, must travel over any portion of an aircraft movement area, it will be escorted by airport authority vehicles equipped with radio capable of communicating with FAA ATCT and properly identified. No personnel may operate vehicles in the AOA unless they have first completed and passed an approved drivers training class.

12. At no time shall active taxiways or runways be crossed by construction equipment without notification and proper approval/clearance from FAA ATCT.
13. Aircraft traffic will continue to use existing runways, aprons, and taxiways of the Airport during the time that work under a contract is being performed. The Contractor shall, at all times, conduct the work as to create no hindrance, hazard, or obstacle to aircraft using the airport.
14. The Contractor and their sub-contractors must also maintain a high level of security during construction when access points are created in the security fencing to permit construction vehicle access. No temporary gates are expected for the project. Procedures conforming to Airport security protocols will 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. Access shall be made available at all times to all airport emergency vehicles traveling to operations areas within the proximity of the construction work zone.

4.8 Wildlife Management

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.

4.8.1 Trash

All trash including food scraps from construction personnel activity must be collected and placed into a waste container with an attached lid to prevent FOD or access from wildlife.

4.8.2 Standing Water

Water shall not be allowed to collect and pool for more than any single 24-hour period.

4.8.3 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 150/5370-10H, Standard Specifications for 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. The use of millet seed in turfing and seeding operations shall not be permitted.

4.8.4 Poorly Maintained Fencing and Gates

See Section 4.7.2 Vehicle and Pedestrian Operations of this document.

4.8.5 Disruption of Existing Wildlife Habitat

Contractor shall immediately notify Airport Operations Personnel of wildlife sightings.

Reference Section 4.12 Inspection Requirements for additional information regarding daily inspection requirements.

4.9 Foreign Object Debris (FOD) Management

Waste and loose materials, commonly referred to as FOD, can cause damage to aircraft landing gears, propellers, and jet engines. Construction contractor employees 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) may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24A, Airport Foreign Object Debris (FOD) Management.

Foreign Object Debris Management Plan: Special care and measures shall be taken to prevent FOD when working in an airport environment. The Contractor shall be held responsible for implementing an approved FOD Management Plan as a part of the SPCD. The FOD Management Plan will have procedures for prevention, regular cleanup, and containment of construction material and debris. The Contractor will ensure all vehicles related to the construction project using paved surfaces in the AOA shall be free of any debris that could create a FOD hazard. All taxiways, taxilanes, VSR, security perimeter roads, aprons, and runways must remain clean. Waste containers with attached lids shall be required on construction sites.

Securing Light-Weight Construction Material: Special attention should be given to securing lightweight construction material (concrete insulating blankets, tarps, insulation, etc.). Specific securing procedures and/or chain-link enclosures may be required.

Construction Equipment Clean-Up: Contractors will provide their own equipment for vehicle and equipment washing and clean up. The Contractor shall clean the necessary vehicles within the Contractor staging area as to prevent tracking of mud and debris onto the AOA. The Contractor shall be responsible for a containment area as to prevent pollution onto and into adjacent conveyance systems. All personnel will be responsible for picking up FOD or reporting spills/hazards. Immediate access to a power sweeper and vacuum truck is required when construction occurs on any pavement area inside the AOA, unless an appropriate alternative has been approved by the Engineer and Airport staff.

Refer to Section 4.12 Inspection Requirements for additional information regarding daily inspection requirements.

4.10 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, hydraulic fluid, or other chemical fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. To that end, the Contractor is required to develop and implement spill prevention and response procedures for vehicle operations. The Contractor shall incorporate these procedures into the SPCD. This includes maintenance of appropriate MSDS data and appropriate prevention and response equipment on-site. Refer to FAA AC 150/5320-15A *Management of Airport Industrial Waste* for more information.

4.11 Notification of Construction Activities

The following is information and procedures for immediate notification of airport stakeholders and the FAA of any conditions adversely affecting the operational safety of the airport.

4.11.1 Points of Contact/List of Responsible Representatives

Information, Compliance, and Assistance:
Deontae Watson, Deputy Airport Director, Airport Operations Personnel Lead (910) 433-1621
Airport Operations (910) 433-1621
Station 10, Fire Department (910) 433-1624

4.11.2 Notices to Airmen (NOTAM)

Only Airport Operations Personnel may initiate or cancel NOTAMs on airport conditions and is the only entity that can close or open a runway or taxiway. The Deputy Airport Director must coordinate with Airport Operations Personnel for 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 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 Deputy Airport Director must file and maintain a list of authorized representatives with the FSS. 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 Deputy Airport Director. See FAA AC 150/5370-2G, Section 2.7.1.1 regarding issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

Any NOTAMs for planned airfield closures for this project must be coordinated through the Airport Operations Personnel and the Deputy Airport Director. Reference Section 4.5.1 Identification of Affected Areas for planned closures for this project, which requires issuance of a NOTAM.

4.11.3 Emergency Notification Procedures

In the event of an emergency, the Contractor shall be required to immediately contact Airport Operations Department by calling (910) 433-1621 or for non-emergencies (910) 433-1624.

In the event of an aircraft emergency, severe weather conditions, or any issue as determined by the airport that may affect aircraft operations, the Contractor's personnel and/or equipment may be required to immediately vacate the area(s) affected. Points of contact for the various parties involved with the project shall be identified and shared at the pre-construction meeting among the various parties, refer to Section 4.3 Coordination. ***Specific emergency notification procedures shall be incorporated into the Contractor's SPCD***.

4.11.4 Coordination with ARFF Personnel

The Contractor shall coordinate, through the Deputy Airport Director, with ARFF personnel, mutual aid providers, and other emergency services if construction requires the following:

- The deactivation and subsequent reactivation of water lines or fire hydrants, or
- The re-routing, blocking and restoration of emergency access routes, or
- The use of hazardous materials on the airfield.

Procedures and methods for addressing any planned or emergency response actions on the airfield concerning this project shall be established and implemented prior to the start of construction.

4.11.5 Notification to the FAA

4.11.5.1 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.

4.11.5.2 Part 157

With some exceptions, Title 14CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the RPR 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. It is not anticipated that Part 157 notifications will be required for this project.

4.11.5.3 NAVAIDS

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: Airport Operations Department at (910) 433-1621. It is not anticipated that NAVAID notifications will be required for this project.

- **Airport owned/FAA maintained**: If construction operations require a shutdown of more than 24 hours, 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.
- **FAA owned:** The Deputy Airport Director must notify the appropriated 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. (Impacts to FAA equipment covered by a Reimbursable Agreement (RA) do not have to be reported by the Deputy Airport Director). 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. In addition, provide seven days' notice to schedule the actual shutdown.

4.12 Inspection Requirements

4.12.1 Daily (or More Frequent) Inspections

Inspections shall be conducted by the Contractor at least daily, but more frequently if necessary, to ensure conformance with the CSPP. A sample checklist is provided in **Appendix D** of this document. In addition to contractor's required inspections, Airport Operations Personnel will inspect the construction site prior to the reopening of any closed active taxiway, runway, and apron. The RPR will have full-time inspectors monitoring activity throughout construction. The contractor is required to immediately remedy and correct any deficiencies to the satisfaction of the Engineer or Deputy Airport Director.

4.12.2 Final Inspections

A final inspection with the Engineer and Airport Operations Personnel will take place prior to allowing aircraft operations to resume.

4.13 Underground Utilities

Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the FAA shall locate all of their underground cables. The Contractor shall locate and/or arrange for the location of all the underground cables. When an underground cable is damaged due to the Contractor's negligence the Contractor shall immediately notify the Deputy Airport Director, as referenced in Section 4.11 Notification of Construction Activities within this document, to repair including possible replacement of the cable affected at his/her own expense. Full coordination between airport staff,

field inspectors, and construction personnel will be exercised to ensure that all airport power and control cables are fully protected prior to any excavation. Locations of cabling will be marked prior to beginning excavation. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that "NC811" or services do not include FAA ATO/Technical Operations and may not locate utilities within the airfield fence.

4.14 Penalties

Failure on the part of the Contractor to adhere to prescribed requirements may have consequences that jeopardize the health, safety or lives of customers and employees at the airport. RPR may issue warnings on the first offense based upon the circumstances of the incident. Individuals involved in non-compliance violations may be required to surrender their Airport ID badges and/or be prohibited from working at the airport, pending an investigation of the matter. Penalties for violations related to airport safety and security procedures will be established by RPR, Airport Operations Personnel, Engineer and/or may be assessed by the FAA, TSA, or a court of competent jurisdiction.

Note: Project shutdown or misdemeanor citations may be issued on a first offense. When construction operations are suspended, activity shall not resume until all deficiencies are rectified.

4.15 Special Conditions

In the event of an aircraft emergency, the Contractor's personnel and/or equipment may be required to immediately vacate the area. The Contractor will receive notification from Airport Operations Personnel when special conditions require the construction site to be vacated. In any event, extreme care should be exercised should construction personnel identify any ARFF (Airport Rescue and Fire-Fighting) vehicle moving toward the Runway with emergency lights displayed. This will generally mean that an emergency situation is imminent.

4.16 Runway and Taxiway Visual Aids

Marking, lighting, signs, and visual NAVAIDs. Those areas where aircraft will be operating shall be clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, the Contractor shall inspect and verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs and visual NAVAIDs remain in place and operational.

4.16.1 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, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

4.16.2 Markings

All taxiway centerline markings leading into the project work site shall be blackened out prior to the start of construction phase. Locations of those centerline markings to be blackened out are graphically illustrated in the project drawings. These markings are to be re-applied at the completion of construction operations. Markings must be in compliance with the standards of AC 150/5340-1M, *Standards for Airport Markings,* current edition, and the drawings and technical specifications of this project.

Runway exit taxiways closed to aircraft operations are marked with lighted barricades, bolted to the asphalt to prevent movement. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers.

1. Closed Runways and Taxiways
    a. Permanently Closed Runways. Not Applicable.
    b. 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.
    c. Partially Closed Runways and Displaced Thresholds. Not Applicable.
    d. Taxiways.
    i. Permanently Closed Taxiways. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway.
    ii. 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.
    e. Temporarily Closed Airport. Not Applicable.

2) The application rate of paint to mark a short-term temporary 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.

4.16.3 Lighting and Visual NAVAIDS

All taxiway edge lights in those sections of taxiways closed to aircraft traffic will be either de-energized or blacked out by use of an appropriately cut length of PVC pipe. Centerline lighting that conflicts with the closed taxiway routing shall be either de-energized, removed from the circuit by use of jumpers or as detailed in the project drawing set. Lighting must conform to AC 150/5340-30J, *Design and Installation Details for Airport Visual Aids*, AC 150/5345-50B, *Specification for Portable Runway and Taxiway Lights*, and AC 150/5345-53D, *Airport Lighting Equipment Certification Program*.

1) **Permanently Closed Taxiways or realigned Taxiways.** Not applicable.
2) **Temporarily Closed Runways.** The contractor shall use the airport provided lighted X, both at night and during the day, and will be placed at each end of the runway facing the approach. The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55A, *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure*. For runways that will be opened periodically, coordinate procedures with the FAA ATCT manager.
3) **Temporarily Closed Taxiways.** The contractor shall deactivate the taxiway lighting circuits as detailed in the plans and specifications. When deactivation is not possible (for example other taxiways on the same circuit are to remain open), cover the light fixture in such a way as to prevent light leakage.

4.16.4 Signs

All taxiway signs in those sections of taxiways closed to aircraft traffic will be either de-energized or blacked out by use of a non-transparent material. Signs are required to conform to AC 150-5345-44L, *Specification for Runway and Taxiway Signs*, AC 50/5340-18H, *Standards for Airport Sign Systems*, and AC 150/5345-53D, *Airport Lighting Equipment Certification Program*.

4.17 Marking and Signs for Access Routes

Location of haul routes on the airport site shall be as specified in the project drawing set and as provided graphically in **Appendix E**. It shall be the Contractor's responsibility to coordinate off-site haul routes with the appropriate owner who has jurisdiction over the affected route. The haul routes, to the extent possible, shall be marked and signed in accordance with FAA airfield signage requirements found in AC 150\5340-18H, *Standards for Airport Sign Systems*, the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or state highway specifications. Signs adjacent to areas used by aircraft must meet the airfield general frangibility requirements located in FAA AC 150\5220-23A, *Frangible Connections*, and as required by the airport and subsequent approval by the Owner. Meeting airfield frangibility requirements may require modification to size and height guidance in the Manual on Uniform Traffic Control Devices (MUTCD).

4.18 Hazard Marking and Lighting

Hazard marking and lighting is a visual aid to help prevent pilots from entering areas closed to aircraft and prevents construction personnel from entering areas open to aircraft. To that end, 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 may also be used for the identification of open manholes, small areas under repair, stockpiled material, waste areas, and taxiway object free areas (TOFA's).

4.18.1 Equipment

4.18.1.1.1 Barricades

Type 1-Low profile barricades of the type detailed in the project drawings shall be placed at the edge of existing taxiway safety areas. Layout locations for this equipment are shown in the project drawing set in **Appendix E**. 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 RPR. Lighting should be checked for proper operation at least once per day, preferably at dusk.

4.18.1.1.2 Barricade Lighting

Barricade lights must be red, either steady burning or flashing, and must meet the luminance requirements of the FAA. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 ft. 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.

4.18.1.1.3 Barricade Supplementation

Supplement barricades with signs (for example "No Entry," "No Vehicles") as necessary.

4.18.1.1.4 Air Operations Area – General

Barricades are not permitted in any active safety areas. Within a runway or taxiway object free area, Type 1-Low profile lighted barricades with flashing red lights as noted above, may be used to separate all construction/maintenance areas from the movement area. All barricades adjacent to any open runway or taxiway safety area, must be as low as possible to the ground, and no more than 18 in 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, or 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 in (7.6 cm) above the ground.

4.18.1.1.5 Air Operations Area – Runway/Taxiway Intersections

Use highly reflective barricades with red lights to close taxiways leading to closed runways. The RPR shall 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.

4.18.1.1.6 Air Operations Area – Other

Outside runway and taxiway object free areas, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including jersey barriers, or barrels, as determined by the RPR.

4.18.1.1.7 Maintenance

The construction specifications 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 RPR and other notifications shall be in accordance with Section 4.11 Notification of Construction Activities. Lighting should be checked for proper operation at least once per day, preferably at dusk.

4.18.1.1.8 Lighted Xs

Runway closure lighted Xs are provided by the owner. Runway closure lighted Xs will be placed over the runway designation numerals of the closed runway. The lighted X must be illuminated at all times that it is on a runway. Contractor shall be responsible for maintaining, installing, fueling, and removing lighted closure markers. Any repairs required to the markers shall be performed immediately such that the lighted runway closure markers function continuously during the project without interruption. All repairs shall be at the contractor's expense at no additional cost.

4.18.1.1.9 Work Zone Lighting for Night-time Construction

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to AC 150/5370-10H, *Standard Specifications for Construction of Airports*, 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.

4.19 Protection of Runway and Taxiway Safety Areas

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 runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces is a standing requirement for the duration of construction operations. Refer to Section 4.7 Contractor Access, Section 4.11 Notification of Construction Activities and Section 4.16 Runway and Taxiway Visual

Aids for taxiway closure requirements. Refer to Section 4.18 Hazard Marking and Lighting for hazard marking. Refer to Section 4.20 Other Limitations on Construction for height restrictions (as required).

4.19.1 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 150/5300-13B, *Airport Design*). Construction activities within the existing RSA are subject to the following conditions:

- No construction may occur within the existing RSA while the runway is open for aircraft operations.
- Excavations:
  - Open trenches or excavations are not permitted within the RSA while the runway is open. The Contractor shall backfill trenches before the runway is opened. If the runway must be opened before excavations are backfilled, cover the excavations appropriately to the satisfaction of the Engineer and Airport Operations Personnel. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damaging the aircraft.
  - Construction contractors must prominently mark and barricade open trenches and excavations at the construction site by using lighted low-profile barricades with flashing red lights during hours of restricted visibility or darkness.
- 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 firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

4.19.2 Runway Object Free Area (ROFA)

Construction, including excavations, may be permitted in the ROFA when closed to aircraft operations. 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.

4.19.3 Taxiway Safety Area (TSA)

The 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. No construction may occur within the TSA while the taxiway is open for aircraft operations. Adjustment of TSA dimensions shall be coordinated with the ATCT and the appropriate FAA Airports Regional or

District Office; issuing a NOTAM will be required. Refer to the plans in **Appendix E** for TSA dimensions.

Open trenches or excavations are not permitted within the TSA while the taxiway is open. The Contractor must backfill trenches before the taxiway is opened. Coverings are not allowed in taxiway safety areas.

After a taxiway has been closed, Contractors must prominently mark and barricade open trenches and excavations at the construction site with red or orange flags, as approved by the RPR, and light them with red lights during hours of restricted visibility or darkness.

Soil erosion must be controlled by the Contractor as 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.

4.19.4 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 than for Runway Object Free Areas. No construction may occur within the TOFA while the taxiway is open for aircraft operations. Refer to the plans in **Appendix E** for TSA dimensions.

4.19.5 Obstacle Free Zone (OFZ)

Construction personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. The OFZ is a defined volume of airspace centered about and above the runway centerline.

4.19.6 Runway Approach/Departure Areas and Clearways

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures.

4.20 Other Limitations on Construction

4.20.1 Prohibitions

The following prohibitions are in effect for the duration of this project:

- No use of equipment with a height of over 50 feet (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.

- No use of open flames welding or torches unless fire safety precautions are provided and the RPR has approved their use.
- No use of electrical blasting caps or explosives of any kind on or within 1,000 ft (300 m) of the airport property.
- No use of flare pots within the AOA.

4.20.2 Restrictions

- *Construction suspension required during specific airport operations:* Construction shall not occur within a taxilane or taxiway OFA while aircraft are using the existing taxiway. Construction shall not occur while the airport is under low visibility operations (LVO).
- *Areas that cannot be worked on simultaneously:* Phase 2 and 3 may not be performed concurrently.
- *Day or night construction restrictions:* For the performance of any night work, refer to Section 4.7.2 Vehicle and Pedestrian Operations. Runway construction designated as night-work only shall be performed between the hours of 12:00 AM and 5:30 AM.
- *Seasonal construction restrictions:* The Contractor will not be permitted to perform construction activities impacting any runways during certain busy holiday times for the Airport. This includes the following:
    - Thanksgiving Week
    - Christmas Week

5 APPENDIX A – RELATED READING MATERIALS

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/.

6 APPENDIX B – TERMS AND ACCRONYMS

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

7 APPENDIX C – 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				
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				

8 APPENDIX D – CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

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.		

9 APPENDIX E – PROJECT SPECIFIC EXHIBITS

CONTRACTOR'S SAFETY AND SECURITY REQUIREMENTS

SAFETY

1. THE TERM "CONTRACTOR" MEANS THE PRIME CONTRACTOR, HIS/HER SUBCONTRACTORS, SUPPLIERS, MATERIAL, MEN, EMPLOYEES, AND OTHERS WHO WILL PERFORM SERVICES FOR OR IN CONJUNCTION WITH THE PRIME CONTRACTOR. THE TERM "OWNER" MEANS THE CITY OF FAYETTEVILLE AND AUTHORIZED REPRESENTATIVES OF THE CITY, OR AIRPORT MAINTENANCE PERSONNEL. THE TERM "AIRPORT OPERATOR" IS DEFINED AS THE FAYETTEVILLE REGIONAL AIRPORT OPERATIONS PERSONNEL. THE TERM RPR REFERS TO THE INDIVIDUAL REPRESENTING THE OWNER IN THE FIELD.

2. THE CONTRACTOR SHALL ACQUAINT THEIR SUPERVISORS AND EMPLOYEES OF THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO FAYETTEVILLE REGIONAL AIRPORT (FAY) AND SHALL CONDUCT THE CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY AS SPECIFIED IN SAFETY NOTE 11. CONTRACTOR SHALL SUBMIT A SAFETY PLAN TO THE OWNER WHICH WILL BE MONITORED ACCORDINGLY. CONSTRUCTION SHALL NOT COMMENCE UNTIL THIS PLAN IS APPROVED BY THE AIRPORT OPERATOR.

3. ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT IN OR NEAR THE ACTIVE AIRCRAFT OPERATIONS AREA (AOA) SHALL BE REQUIRED TO:

   3.1. DISPLAY AN APPROVED PERMANENT COMPANY LOGO ON BOTH SIDES OF THE VEHICLE
   3.2. DISPLAY IN FULL VIEW A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT
   3.3. IF FLASHING AMBER (YELLOW) DOME-TYPE LIGHT IS NOT DISPLAYED, VEHICLES SHALL DISPLAY A 3' X 3' OR LARGER ORANGE AND WHITE CHECKERBOARD FLAG. EACH CHECKERBOARD COLOR SHALL BE 1-FOOT SQUARE, (SEE CONSTRUCTION SAFETY FLAG DETAIL 2/ THIS SHEET), AND ESCORTED UNDER THE CONTROL OF ONE CONTRACTOR MOBILE (TWO-WAY) RADIO OPERATOR ON THE JOB AT ALL TIMES. USE OF A ORANGE AND WHITE CHECKERBOARD FLAG IS ONLY PERMITTED DURING DAYLIGHT HOURS (SEE BELOW).

   THE AOA IS DEFINED AS ANY AREA OF THE AIRPORT USED OR INTENDED TO BE USED FOR THE LANDING, TAKEOFF, OR SURFACE MANEUVERING OF AIRCRAFT. ANY VEHICLE OPERATING IN OR NEAR THE ACTIVE AOA DURING THE HOURS OF DARKNESS SHALL BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME LIGHT, MOUNTED ON TOP OF THE VEHICLE AND BE OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES. ALL RADIO EQUIPPED VEHICLES SHALL COORDINATE AIR TRAFFIC CONTROL TOWER CALL SIGNS WITH AIRPORT OPERATIONS PRIOR TO OPERATING ONSITE. THE CONTRACTOR, THROUGH THE DESIGNATED CONTRACTOR'S SECURITY AND SAFETY OFFICER (CSSO), SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUBCONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE.

4. WHEN ANY VEHICLE, OTHER THAN THOSE HAVING PRIOR APPROVAL FROM THE AIRPORT OPERATOR, MUST TRAVEL OVER ANY PORTION OF AN AIRCRAFT MOVEMENT AREA, IT MUST BE ESCORTED BY AN APPROVED VEHICLE WITH BADGE CREDENTIALS.

5. ALL CONSTRUCTION VEHICLES MUST BE EQUIPPED WITH A RADIO CAPABLE OF COMMUNICATING WITH AIR TRAFFIC CONTROL AND PROPERLY IDENTIFIED. SEE NOTE 13.

6. NO RUNWAY, TAXIWAY, APRON OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF THE AIRPORT OPERATOR. TO ENABLE NECESSARY "NOTICES TO AIRMEN" (NOTAM) OR ADVISORIES TO AIRPORT SERVICES OR TENANTS, A MINIMUM OF 7 BUSINESS DAYS WRITTEN NOTICE REQUESTING CLOSING SHALL BE DIRECTED TO THE RPR WHO WILL COORDINATE THE REQUEST WITH THE AIRPORT OPERATOR. OWNER PROVIDED LIGHTED X'S SHALL BE PLACED AT BOTH ENDS OF THE RUNWAY PRIOR TO RUNWAY CLOSURE. THE CONTRACTOR IS TO COORDINATE WITH THE RPR AND THE AIRPORT OPERATOR.

7. STOCKPILED MATERIAL SHALL BE CONSTRAINED IN A MANNER TO PREVENT MOVEMENT RESULTING FROM AIRCRAFT JET BLAST OR WIND CONDITIONS IN EXCESS OF TWENTY MILES PER HOUR. MAX STOCKPILE HEIGHT OF 15' IN DESIGNATED AREAS ONLY AS SHOWN ON THE PLANS. IN ADDITION, STOCKPILED MATERIAL SHALL HAVE SILT FENCE LOCATED AROUND THE MATERIAL TO PREVENT FOREIGN OBJECT DEBRIS (FOD) FROM MOVING ONTO THE AIRFIELD PAVEMENTS OR POLLUTING WATERCOURSES. SEE EROSION CONTROL DETAILS.

8. OPEN TRENCHES, EXCAVATIONS AND STOCKPILED MATERIAL LOCATED IN OR NEAR THE AOA SHALL BE PROMINENTLY MARKED WITH APPROVED FLAGS AND LOW-PROFILE BARRICADES AND LIGHTED BY APPROVED LIGHT UNITS DURING HOURS OF RESTRICTED VISIBILITY AND DARKNESS.

9. DEBRIS, WASTE AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS OR BEING INGESTED IN JET ENGINES SHALL NOT BE ALLOWED ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS. IF THESE MATERIALS ARE OBSERVED TO BE ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS, THEY WILL BE REMOVED IMMEDIATELY AND CONTINUOUSLY DURING CONSTRUCTION. IF THESE MATERIALS ARE OBSERVED AT ANYTIME, THE CONTRACTOR SHALL REMOVE THEM IMMEDIATELY. A BROOM TRUCK AND VACUUM TRUCK (SAFETY NOTE 14) SHALL BE AVAILABLE AT ALL TIMES DURING THE PROJECT TO IMMEDIATELY REMOVE DUST, DEBRIS, OR FOD.

10. THE CONTRACTOR IS DIRECTED TO COMPLY WITH AND ACQUAINT HIS/HER EMPLOYEES WITH THE FOLLOWING SAFETY GUIDELINES, RELATED MATERIALS AND MOST RECENTLY PUBLISHED FAA ADVISORY CIRCULARS, LATEST EDITION:

    150/5200-18 "AIRPORT SAFETY SELF-INSPECTION"
    150/5210-5 "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AN AIRPORT"
    150/5370-2 "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"

    COPIES OF THESE DOCUMENTS ARE AVAILABLE ONLINE AT:
    HTTP://WWW.FAA.GOV/AIRPORTS/RESOURCES/ADVISORY_CIRCULARS/

11. THE CONTRACTOR SHALL PREPARE SAFETY PLANS SPECIFIC TO 1) DAYTIME AND NIGHTTIME CONSTRUCTION OPERATIONS, AS WELL AS A 2) CONTINGENCY PLAN TO ADDRESS CASES OF ABNORMAL FAILURES OR UNEXPECTED DISASTERS.

12. HAUL ROUTES ON THE AIRFIELD SHALL BE DELINEATED WITH LIGHTED LOW-PROFILE BARRICADES (SEE LOW PROFILE BARRICADE DETAIL 1/ THIS SHEET) AT LOCATIONS INDICATED ON THE CONTRACT DOCUMENTS. OTHER MEANS TO CLEARLY MARK THE ROUTES TO THE WORK SITE MAY BE APPROVED ONLY BY THE RPR, ENGINEER AND/OR THE AIRPORT OPERATOR.

13. ALL COMMUNICATION WITH THE AIR TRAFFIC CONTROL TOWER OR OTHER ELEMENTS OF THE AIRPORT SHALL BE THROUGH THE RPR AND AIRPORT OPERATOR.

14. THE CONTRACTOR SHALL HAVE A BROOM TRUCK AND VACUUM TRUCK IN GOOD WORKING ORDER READILY AVAILABLE FOR THE DURATION OF THE PROJECT TO CONTINUOUSLY VACUUM ALL PAVEMENTS AFFECTED BY CONSTRUCTION.

15. NO PERSONNEL MAY OPERATE VEHICLES AIRSIDE UNLESS 1) THEY HAVE FIRST COMPLETED AND PASSED AN AIRPORT APPROVED DRIVERS TRAINING CLASS, OR 2) THEY ARE UNDER ESCORT BY BADGED AND PERMITTED PERSONNEL AT ALL TIMES. AIRSIDE IS DESCRIBED AS ANY AREA INSIDE THE SECURITY FENCING. ALL PERSONNEL OPERATING VEHICLES ONSITE AND/OR COMMUNICATING WITH THE ATCT MUST ATTEND AND COMPLETE THE AIRPORT'S DRIVER TRAINING COURSE PRIOR TO OPERATING VEHICLES ONSITE.

16. THE CONTRACTOR SHALL INSTALL ALL REQUIRED BARRICADES AT DESIGNATED PLAN LOCATIONS. ALL THESE ITEMS SHALL CONSIST OF THE SAFETY AND SECURITY SYSTEM. THE CONTRACTOR SHALL INSTALL THE COMPONENTS OF THE SYSTEM AT THE APPROPRIATE TIMES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSPECT EVERY ASPECT OF THE SAFETY AND SECURITY SYSTEM ON A DAILY BASIS AND ENSURE ALL COMPONENTS ARE FUNCTIONING PROPERLY. THE RPR SHALL ALSO INSPECT THE SYSTEM DAILY AND ISSUE CORRECTIVE ACTION IF NECESSARY. THE SYSTEM ELEMENTS TO BE INSPECTED AND DEFICIENCIES NOTED ARE AS FOLLOWS:

    - BARRICADES SET PROPERLY AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY.
    - ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES MANNED AND COMMUNICATION AND SECURITY PROCEDURES IN PLACE.
    - ALL EQUIPMENT FLAGGED OR OUTFITTED WITH FLASHING AMBER DOME-TYPE LIGHTS.
    - CONTRACTOR USE OF UNAUTHORIZED AIRPORT ACCESS GATES CHECKED.
    - INSTALLATION OF ALL TEMPORARY TAXIWAY OR RUNWAY LIGHTING AND/OR SIGNAGE.

    ANY OF THE ABOVE SAFETY AND SECURITY ITEMS FOUND TO BE DEFICIENT AT THE BEGINNING OF THE DAY SHALL RESULT IN THAT DAY'S PRORATED SAFETY AND SECURITY BID ITEM AMOUNT DEDUCTED PERMANENTLY FROM THE CONTRACTOR'S EARNINGS.

17. THE CONTRACTOR SHALL COORDINATE WITH THE RPR TO ENSURE ALL RUNWAY AND TAXIWAY LIGHTS, SIGNAGE, NAVIGATIONAL AIDS, AND PAVEMENT SENSOR SYSTEMS, WITHIN OR DIRECTING AIRFIELD TRAFFIC TO CLOSED PORTIONS OF THE AIRFIELD, ARE DE-ENERGIZED PRIOR TO CONSTRUCTION.

SECURITY

1. GENERAL INTENT: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN. THE CONTRACTOR SHALL DESIGNATE TO THE RPR AND AIRPORT OPERATOR, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY & SAFETY OFFICER (CSSO)." THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT. THE CSSO SHALL PROVIDE TELEPHONE NUMBERS WHICH ALLOW THE RPR AND/OR THE AIRPORT OPERATOR THE ABILITY TO CONTACT THE CSSO 24 HOURS A DAY.

2. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA.

3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY THE OWNER. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE OR GUIDED BY AUTHORIZED CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE, AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ON THE SITE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL FOLLOW THE DESIGNATIONS WITHIN THE PLANS OR AS DIRECTED BY THE AIRPORT OPERATOR. THE CONTRACTOR SHALL DAISY CHAIN ALL PERMANENT AND TEMPORARY ACCESS GATES TO THE PROJECT SITE AND STAGING AREAS.

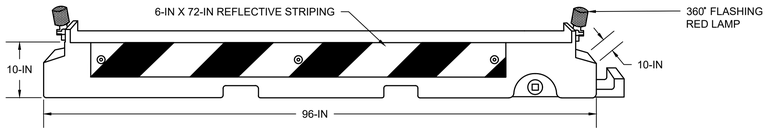
4. CONSTRUCTION AREA LIMITS: THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, PLANT SITE, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR. THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS SUITABLE FENCING, MARKING AND WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS WILL BE REQUIRED AT CRITICAL ACCESS POINTS. TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.

5. IDENTIFICATION - PERSONNEL: THE FAYETTEVILLE REGIONAL AIRPORT RESERVES THE RIGHT TO REQUIRE AIRPORT BADGING FOR CONTRACTOR'S EMPLOYEES DURING THE COURSE OF THIS CONSTRUCTION PROJECT. CONTRACTOR SHALL COMPLY WITH ALL BADGING REQUIREMENTS SET FORTH IN CONTRACT SPECIAL CONDITIONS. SEE CONTRACT SPECIAL CONDITIONS FOR BADGING AND ESCORT REQUIREMENTS.

6. FINES: PAYMENT OF ALL FINES ASSESSED TO FAYETTEVILLE REGIONAL AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA REGULATIONS OR SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

7. VEHICLE PARKING: CONTRACTOR EMPLOYEE VEHICLES SHALL BE RESTRICTED TO THE CONTRACTOR'S EMPLOYEE PARKING AREA AND ARE NOT ALLOWED ON THE AOA AT ANY TIME. SEE SHEET C012 FOR CONTRACTOR EMPLOYEE PARKING LOCATIONS.

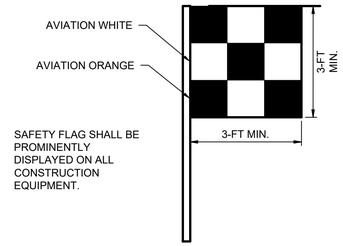
8. GATE ACCESS: ALL DRIVERS ENTERING THROUGH AOA ACCESS POINTS MUST BE BADGED BY THE AIRPORT OPERATOR. ARRANGEMENTS SHOULD BE MADE TO COORDINATE WITH THE AIRPORT OPERATIONS STAFF TO ESCORT UNBADGED CONSTRUCTION EMPLOYEES THROUGH THE ACCESS POINT.



1 LOW PROFILE BARRICADE DETAIL

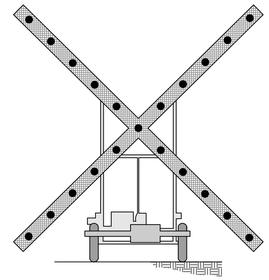
NTS

1. LOW LEVEL LIGHTED BARRICADES SHALL BE INSTALLED ACROSS PAVED AREAS ADJACENT TO AOA AT 4-FT MAX. SPACING OR AS DIRECTED. SEE PHASING PLAN FOR LOCATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING TOTAL NUMBER OF NECESSARY BARRICADES FOR INTENDED CONSTRUCTION OPERATIONS, AND SHALL PROVIDE ADEQUATE NUMBER TO ENSURE REQUIRED SAFETY. CONTRACTOR SHALL BE RESPONSIBLE TO MOVE, RELOCATE AND STORE BARRICADES DURING CONSTRUCTION CONTRACT TIME. THE BARRICADES SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT THE END OF THE PROJECT.
3. BARRICADE LIGHT SHALL BE RED, SOLAR POWERED MODEL OR APPROVED EQUAL. LIGHTS MUST BE MOUNTED ON BARRICADES AND SPACED AT NO MORE THAN 10-FT. LIGHTS MUST BE EITHER STEADY BURNING OR FLASHING, AND MUST MEET THE LUMINANCE REQUIREMENTS OF THE STATE HIGHWAY DEPARTMENT.
4. PAYMENT FOR BARRICADES AND BARRICADE PLACEMENT SHALL BE MADE UNDER TEMPORARY CONSTRUCTION ITEMS.



2 CONSTRUCTION FLAG DETAIL

NTS

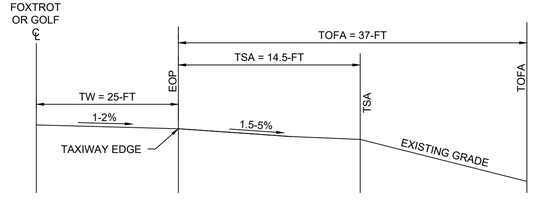


3 RUNWAY CLOSURE LIGHTED X DETAIL

NTS

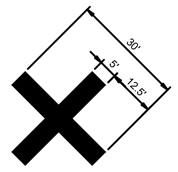
LIGHTED X NOTES:

1. CONTRACTOR SHALL PLACE, OWNER PROVIDED, LIGHTED RUNWAY CLOSURE MARKERS. PLACEMENT OF LIGHTED "X" SHALL BE INCIDENTAL TO TEMPORARY CONSTRUCTION ITEMS.
2. RUNWAY CLOSURE LIGHTED "X" SHALL BE PLACED OVER THE RUNWAY DESIGNATION NUMERALS OF THE CLOSED RUNWAY. LIGHTED "X" MUST BE ILLUMINATED AT ALL TIMES THAT IT IS ON A RUNWAY.
3. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN, INSTALL, FUEL AND REMOVE LIGHTED CLOSURE MARKERS. ANY REPAIRS REQUIRED TO THE MARKERS SHALL BE PERFORMED IMMEDIATELY SUCH THAT THE LIGHTED RUNWAY CLOSURE MARKERS FUNCTION CONTINUOUSLY DURING THE PROJECT WITHOUT INTERRUPTION. ALL REPAIRS SHALL BE AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COMPENSATION. PAYMENT FOR MAINTAINING, MOVING, AND FUEL OF RUNWAY CLOSURE MARKERS SHALL BE MADE UNDER TEMPORARY CONSTRUCTION ITEMS.

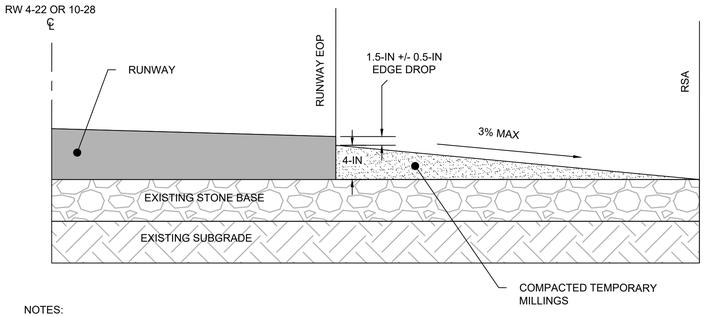


4 TSA AND OFA REQUIREMENTS

NTS



TAXIWAY CLOSURE MARKER



NOTES:

1. CONTRACTOR SHALL INSTALL TEMPORARY MILLINGS RAMP WHEN THE RUNWAY IS ACTIVE. INSTALLATION OF RAMP AND TIME NEEDED TO INSTALL MUST BE INCORPORATED WITHIN THE RUNWAY CLOSURE TIME. NO ADDITIONAL TIME WILL BE GIVEN TO ACCOMMODATE INSTALLATION.
2. PAYMENT FOR LABOR, EQUIPMENT USE, CONSTRUCTION OF COMPACTED TEMPORARY MILLINGS, AND REMOVAL/RELOCATION ON RADAR ROAD SHALL BE INCIDENTAL TO THE MILLINGS PLACEMENT ON RADAR ROAD PAY ITEM.

5 TEMPORARY MILLINGS RAMP

NTS

NOTES

1. TAXIWAY CLOSURE MARKERS SHALL BE PROVIDED AND MAINTAINED BY THE CONTRACTOR AS AN INCIDENTAL TO C-105-1 TEMPORARY CONSTRUCTION ITEMS. NO SEPARATE PAYMENT SHALL BE MADE FOR RUNWAY AND TAXIWAY CLOSURE MARKERS. MARKERS SHALL BE YELLOW AND CONSTRUCTED OF VINYL OR A MATERIAL APPROVED BY THE RPR. SUBMIT MATERIALS, SPECIFICATIONS, DIMENSIONS, AND SECURING METHODS TO THE RPR FOR APPROVAL.
2. THE CLOSURE MARKERS SHALL BE PROPERLY WEIGHTED WITH YELLOW COLORED WEIGHTS, SUCH AS SANDBAGS, TO THE PAVEMENT TO PREVENT DISLOCATION FROM THE WIND. THE RPR SHALL APPROVE THE CONTRACTOR'S METHODS TO PROPERLY WEIGH THE VINYL X TO THE PAVEMENT. THE NUMBER OF WEIGHTS REQUIRED SHALL BE DETERMINED BY THE CONTRACTOR TO PROPERLY WEIGHT THE VINYL X TO THE PAVEMENT.
3. TAXIWAY CLOSURE MARKINGS SHALL BE INSPECTED DAILY TO ENSURE THEY ARE CLEAN AND PROPERLY WEIGHTED DOWN. CONTRACTOR SHALL ENSURE YELLOW X'S MAINTAIN THEIR COLOR THROUGHOUT DURATION OF THE PROJECT AND DO NOT BECOME DISCOLORED THROUGH APPLICATION OF TACK COAT OR OTHER PAVING OPERATIONS.

6 TAXIWAY CLOSURE MARKING

NTS

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

SAFETY AND SECURITY NOTES AND DETAILS

SHEET NUMBER

C011

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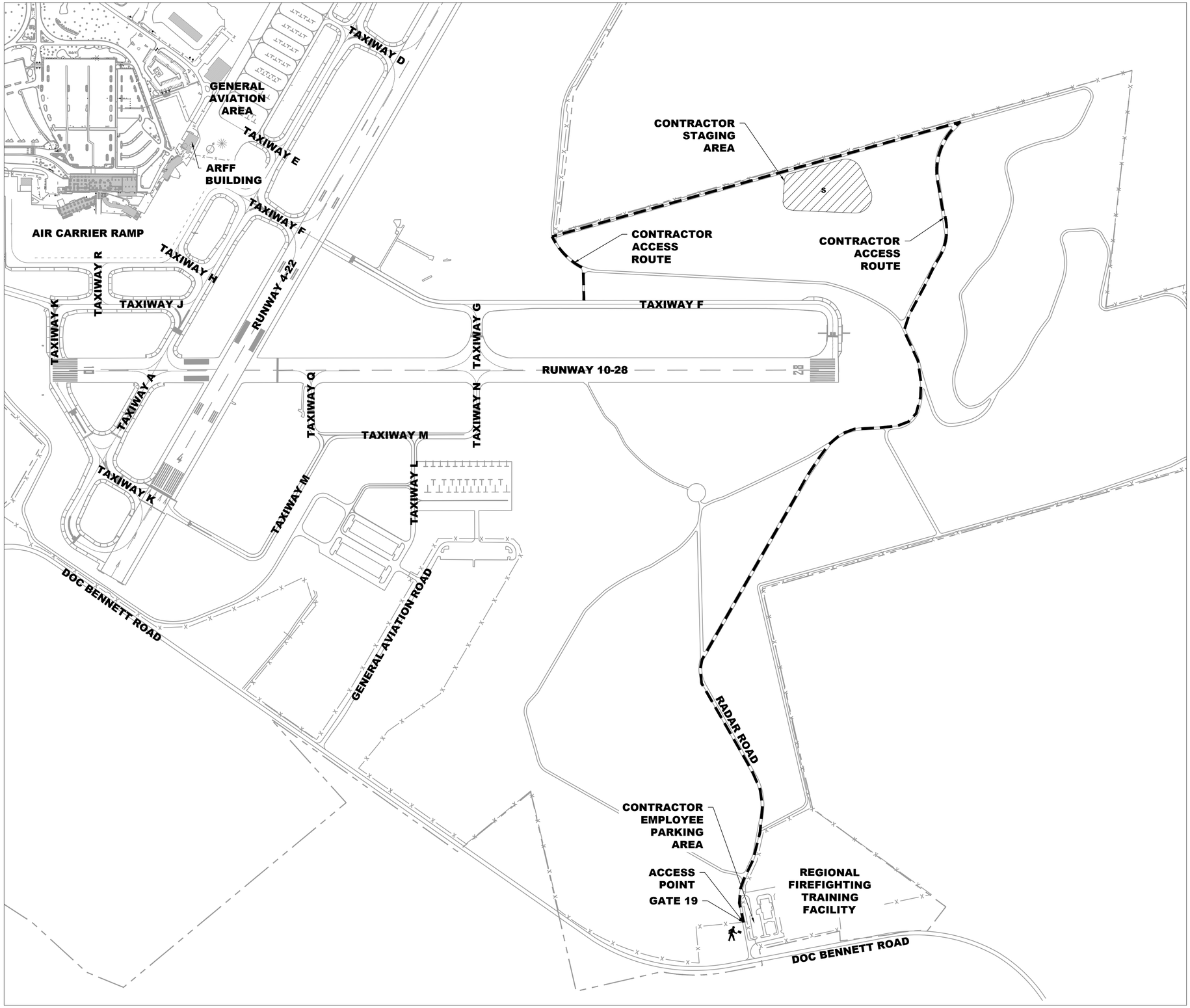

LEGEND

- S — STAGING AREA
- ACCESS ROUTE
- CONTRACTOR SUPPLIED GATE GUARD
- AOA FENCE
- AIRPORT PROPERTY LIMITS

NOTES

1. GATE ACCESS SHALL BE LIMITED TO BADGED PERSONNEL.
2. FOR PERIODS WHEN THE GATE MUST BE ACCESSED CONTINUOUSLY THROUGHOUT THE PROJECT SCHEDULE, THE CONTRACTOR MAY PROVIDE A GATE GUARD TO BE STATIONED AT GATE 19. THE GATE GUARD WILL BE INCIDENTAL TO THE "SAFETY & SECURITY" PAY ITEM.
3. THE CONTRACTOR WILL PLACE SIGNAGE AS DIRECTED HERE, DIRECTING TRAFFIC ALONG THE ACCESS ROAD. ALL SIGNAGE SHALL BE INCIDENTAL TO THE "TEMPORARY CONSTRUCTION" PAY ITEM.
4. THE CONTRACTOR IS NOT PERMITTED, UNLESS DIRECTED BY THE OWNER, TO DEVIATE FROM THIS ACCESS PLAN.
5. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER.

NORTH

300 0 300 600

SCALE (IN FEET)

1 INCH = 300 FEET (WHEN PRINTED 34"x22")

WARNING!!!! WARNING!!!! THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES, AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUND CABLES AND PIPES TRAVERSING THE AIRFIELD PAVEMENT AREAS. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO STARTUP OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY ITEM DAMAGE, CAUSED BY HIS ACTIONS, WITH NO ADDITIONAL COMPENSATION. WARNING!!!!

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

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REVISIONS

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DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

CONTRACTOR ACCESS PLAN

SHEET NUMBER

C012

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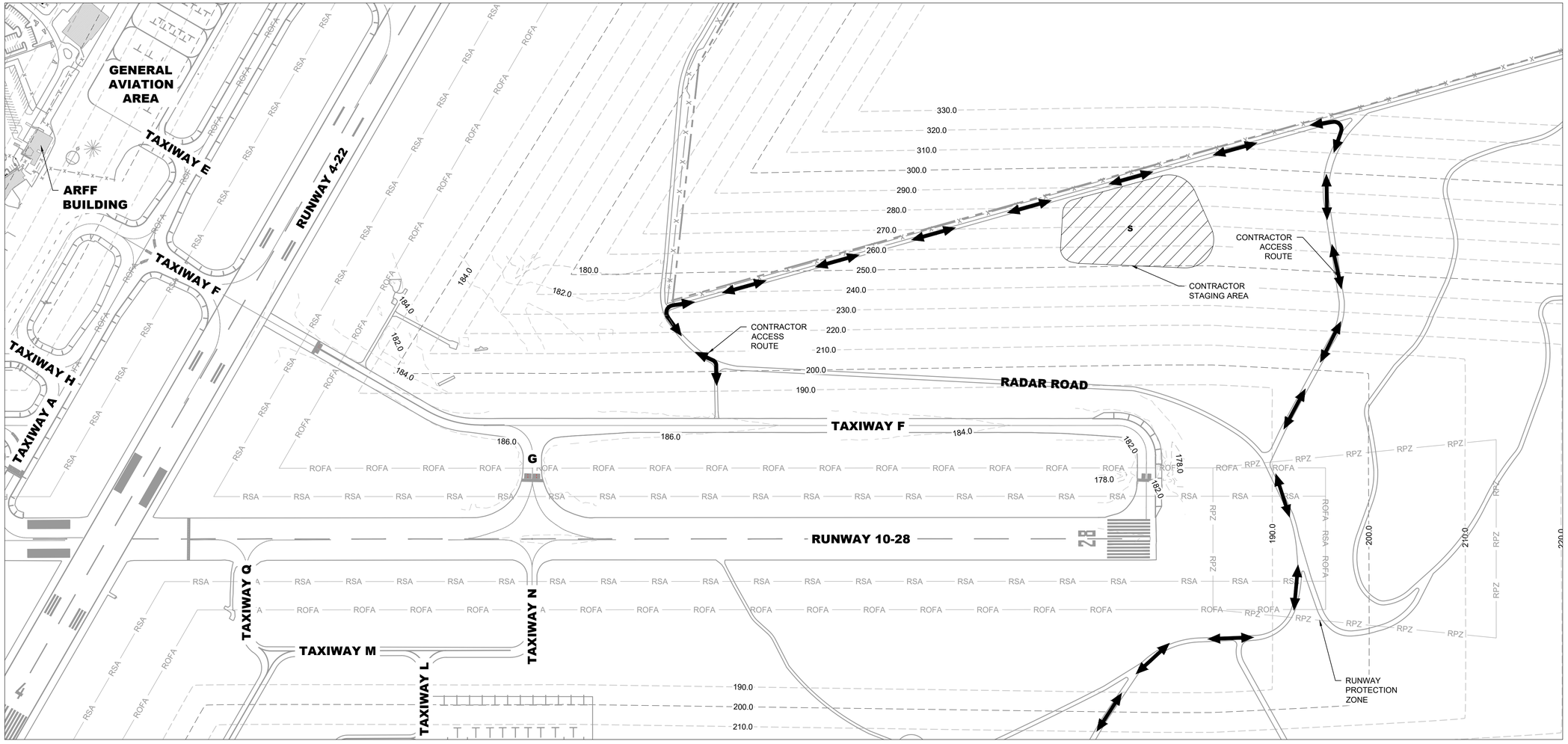

NOTES

1. THE CONTOURS SHOWN REPRESENT MSL ELEVATION LIMITS FOR CONSTRUCTION EQUIPMENT AS DEFINED BY PART 77 OF THE FAA REGULATIONS. CONSTRUCTION CRANES, VEHICLES, AND OTHER EQUIPMENT PENETRATING THESES SURFACES ARE CONSIDERED OBSTRUCTIONS TO AIR NAVIGATION. PRIOR TO SUCH EQUIPMENT USE, FAA NOTIFICATIONS, APPROVALS, AND SPECIAL OPERATING CONDITIONS MUST BE ESTABLISHED. IF ELEMENTS OF THE CONSTRUCTION PROJECT REQUIRE PART 77 SURFACE PENETRATION, A FAA FORM 7460-1 MUST BE SUBMITTED BY THE CONTRACTOR AS SOON AS POSSIBLE BEFORE CONSTRUCTION BEGINS. FAA APPROVAL CAN TAKE SEVERAL WEEKS TO OCCUR. AFTER THE FORM HAS BEEN APPROVED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND RPR A MINIMUM OF 72 HOURS IN ADVANCE WHEN ANY OF THE PART 77 WILL BE PENETRATED. THE FAA AND AIRPORT OPERATIONS HAVE THE RIGHT TO REQUIRE ANY CONSTRUCTION EQUIPMENT PENETRATING THE PART 77 SURFACES TO BE REMOVED DUE TO WEATHER OR OTHER SPECIAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
2. PART 77 AIRSPACE CONTOURS ARE BASED OFF OF PUBLISHED AIRPORT ELEVATIONS AND APPROACHES AND FAA PART 77 OBJECTS AFFECTING NAVIGABLE AIRSPACE. CONTOURS SHOWN DEPICT THE AIRSPACE CONTOURS THAT ARE ACTIVE WHILE RUNWAY 4-22 AND RUNWAY 10-28 ARE ACTIVE.

LEGEND

- S — STAGING AREA
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- RPZ — RUNWAY PROTECTION ZONE
- MAJOR PART 77 SURFACE CONTOURS (50')
- MINOR PART 77 SURFACE CONTOURS (10')
- EXISTING MAJOR CONTOUR (10')
- EXISTING MINOR CONTOUR (2')
- ACCESS ROUTE
- X — AOA FENCE
- AIRPORT PROPERTY LIMITS

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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DRAWN BY:	SVO
REVIEWED BY:	AEB

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PART 77 AIRSPACE PLAN

SHEET NUMBER

C013

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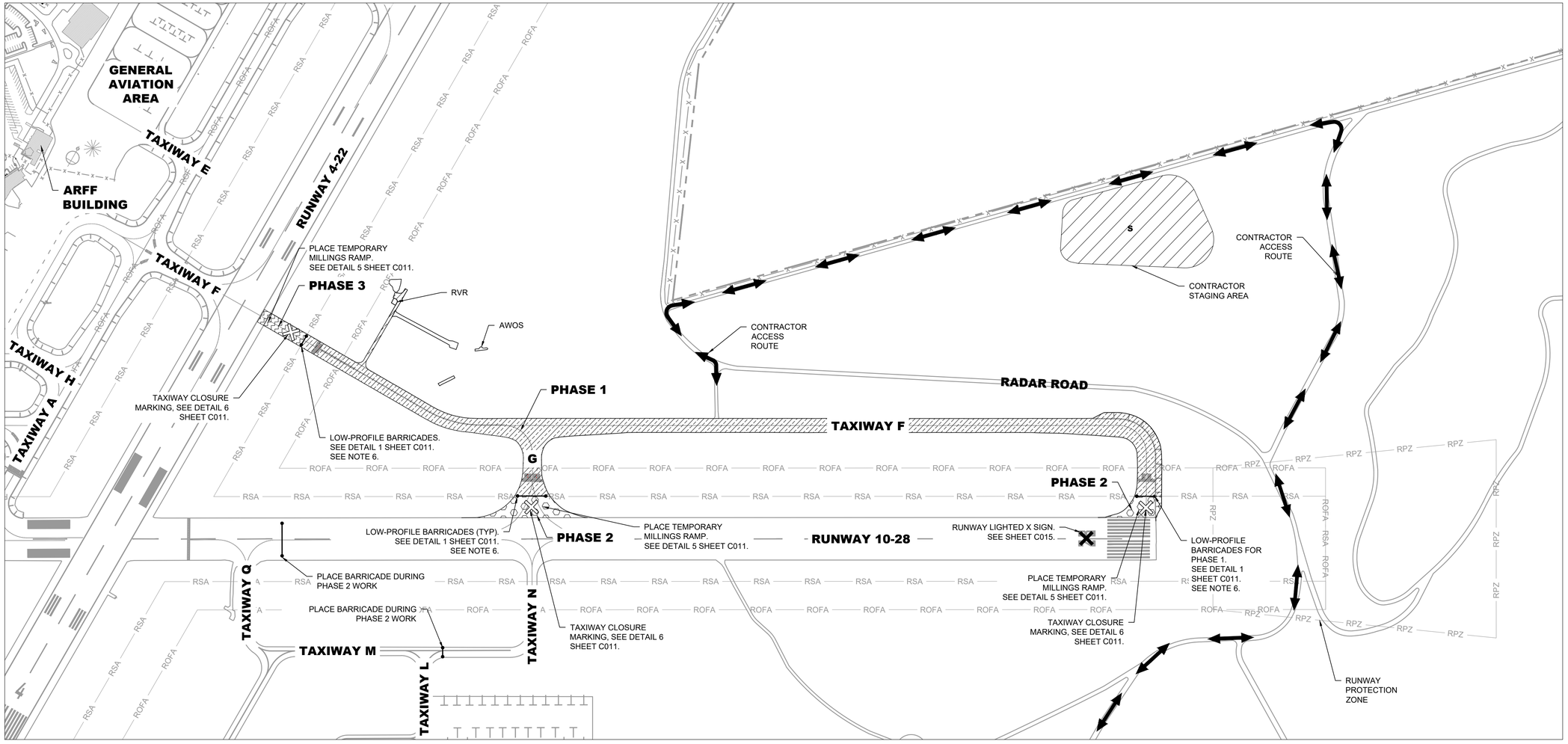
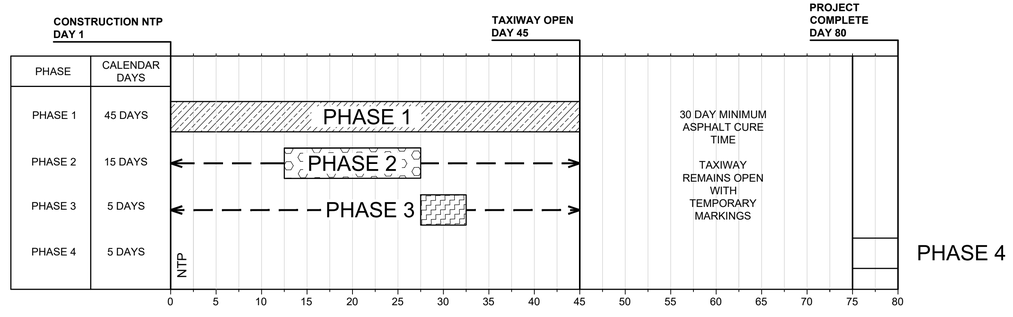


CONSTRUCTION SEQUENCING



PHASE 1 CLOSURES
- TAXIWAY F AND G
- TEMPORARY CLOSURE: RUNWAY 4-22, 12:00 AM - 5:30 AM
- TEMPORARY CLOSURE: RUNWAY 10-28

PHASE 1 WORK
- EXISTING MARKING OBLITERATION
- SHOULDER PAVEMENT REMOVAL
- SHOULDER GRADING
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 2 CLOSURES
- TAXIWAY F, G, N, AND RUNWAY 10-28
- NO TIME RESTRICTIONS

PHASE 2 WORK
- COMPLETED CONCURRENTLY WITH PHASE 1
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 3 CLOSURES
- TAXIWAY F, G, AND RUNWAY 4-22
- NIGHT TIME HOURS ONLY: 12:00 AM - 5:30 AM

PHASE 3 WORK
- COMPLETED CONCURRENTLY WITH PHASE 1, WORK SHALL NOT OCCUR CONCURRENTLY WITH PHASE 2
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 4 CLOSURES
- TAXIWAY F, G, AND RUNWAY 10-28 NO TIME RESTRICTIONS
- RUNWAY 4-22 NIGHT TIME HOURS ONLY: 12:00 AM - 5:30 AM

PHASE 4 WORK
- PERMANENT PAVEMENT MARKING APPLICATION AND AS-BUILT PAVEMENT MARKING SURVEY

GENERAL PHASING NOTES

1. ALL PHASES MUST BE COMPLETED WITHIN CONTRACT DURATIONS.
2. EACH PHASE OF WORK SHALL BE CONTINUOUS UNLESS NOTED OTHERWISE. AN IMPACT NOTICE MUST BE SUBMITTED TO THE RPR A MINIMUM OF 7 BUSINESS DAYS PRIOR TO BEGINNING ANY NEW PHASE OF WORK.
3. REFER TO SHEET C111 FOR MILLINGS PLACEMENT LOCATION.
4. THE CONTRACTOR SHALL PLACE BOTH LIGHTED RUNWAY CLOSURE SIGNS AT BOTH ENDS OF THE RUNWAY IN ACCORDANCE WITH THE TEMPORARY RUNWAY CLOSURE PLAN ON SHEET C015.
5. CONTRACTOR MUST WAIT A MINIMUM OF 30 DAYS FOR THE ASPHALT TO CURE BEFORE APPLYING PERMANENT PAVEMENT MARKINGS, WHICH IS REFLECTED IN THE CONSTRUCTION SCHEDULE.
6. PLACE BARRICADES A MINIMUM OF 50 FEET OUTSIDE THE ASSOCIATED RSA. BARRICADE POSITIONS SHOWN ARE SCHEMATIC.
7. THE CONTRACTOR SHALL BE PROVIDED A 30-DAY ADMINISTRATIVE NTP PRIOR TO THE CONSTRUCTION NTP.

LEGEND

- PHASE 1 WORK AREA
- PHASE 2 WORK AREA
- PHASE 3 WORK AREA
- STAGING AREA (S)
- ACCESS ROUTE
- RUNWAY LIGHTED X SIGN
- TAXIWAY CLOSURE MARKING
- RPZ — RUNWAY PROTECTION ZONE
- LOW-PROFILE BARRICADES
- X — AOA FENCE
- AIRPORT PROPERTY LIMITS
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA

NORTH

200 0 200 400

SCALE (IN FEET)
1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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CONTRACTOR PHASING PLAN

SHEET NUMBER
C014

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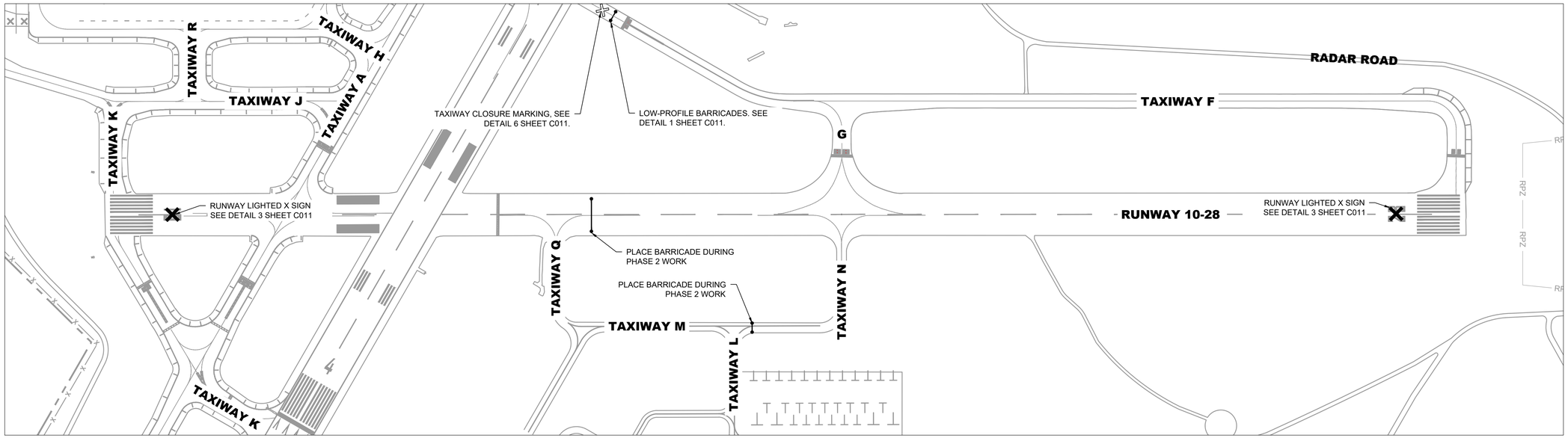


RUNWAY 10-28

TEMPORARY CLOSURE NOTES

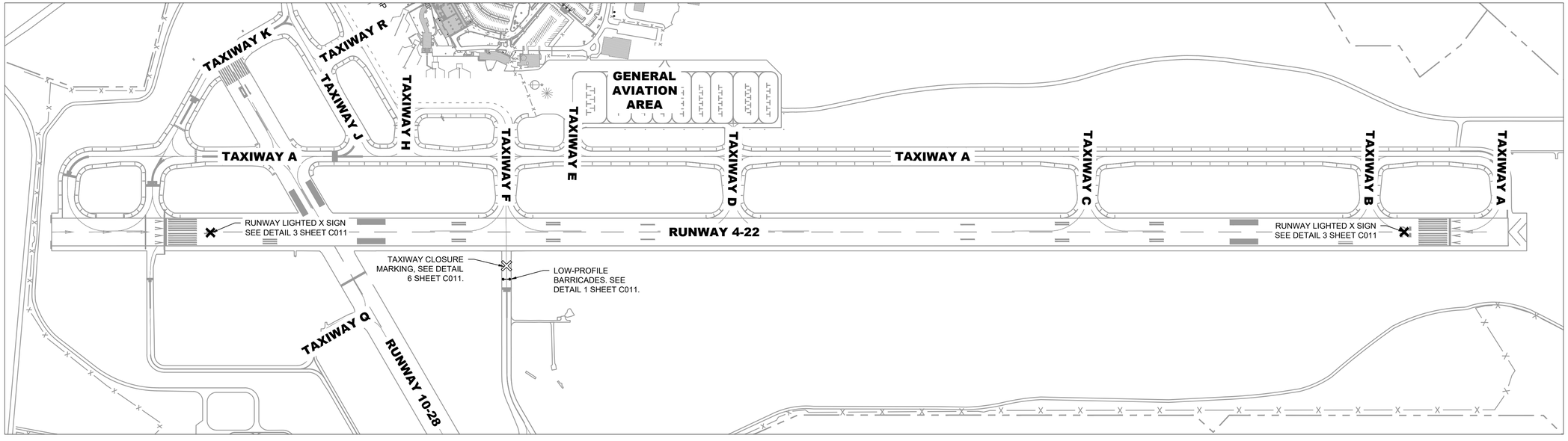
1. RUNWAY 10-28 SHALL BE CLOSED INTERMITTENTLY AND MAY NOT BE CLOSED CONCURRENTLY WITH RUNWAY 4-22 DURING PHASE 2 AND 4. REFER TO SHEET C014 FOR PHASING SCHEDULE AND ASSOCIATED WORK.

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")



RUNWAY 4-22

TEMPORARY CLOSURE NOTES

1. RUNWAY 4-22 SHALL BE CLOSED DURING PHASE 3 AND 4. REFER TO SHEET C014 FOR PHASING SCHEDULE AND ASSOCIATED WORK.
2. WORK REQUIRING CLOSURE OF RUNWAY 4-22 SHALL BE PERFORMED DURING NIGHT TIME HOURS 12:00 AM TO 5:30 AM.

NORTH

300 0 300 600

SCALE (IN FEET)

1 INCH = 300 FEET (WHEN PRINTED 34"x22")

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TEMPORARY RUNWAY CLOSURE PLAN

SHEET NUMBER

C015

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"General Decision Number: NC20260081 05/18/2026

State: North Carolina

Construction Types: Heavy

Counties: North Carolina Counties of
Cumberland and Hoke

Excludes Dredging

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

SUNC2011-062 08/26/2011

	Rates	Fringes
TRUCK DRIVER	$ 13.12	1.89
OPERATOR: LOADER	$ 15.13	2.79
OPERATOR: BULLDOZER	$ 14.63	0.00
OPERATOR: BACKHOE/EXCAVATOR/TRACKHOE	$ 14.71	0.00
LABORER: PIPELAYER	$ 12.87	2.21
LABORER: COMMON OR GENERAL	$ 9.21	0.00
ELECTRICIAN	$ 15.41	3.13
CARPENTER, INCLUDES FORM WORK	$ 13.98	0.69

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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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.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers

at least $13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the 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

"

"General Decision Number: NC20260090 05/18/2026

State: North Carolina

Construction Types: Highway

Counties: North Carolina Counties of
Brunswick, Cumberland, Currituck,
Edgecombe, Franklin, Greene, Hoke,
Johnston, Nash, New Hanover, Onslow,
Pender, Pitt, Wake and Wayne

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

SUNC2014-005 11/17/2014

	Rates	Fringes
TRUCK DRIVER (GVWR OF 26,001 LBS OR GREATER)	$ 12.37	0.00
TRUCK DRIVER (GVWR OF 26,000 OR LESS)	$ 11.12	0.00
POWER EQUIPMENT OPERATOR: MILLING MACHINE	$ 15.36	0.00
POWER EQUIPMENT OPERATOR: MECHANIC	$ 17.55	0.00
POWER EQUIPMENT OPERATOR (TACK TRUCK/DISTRIBUTOR OPERATOR)	$ 14.52	0.00
POWER EQUIPMENT OPERATOR (SLIP FORM MACHINE)	$ 16.50	0.00
POWER EQUIPMENT OPERATOR (SCRAPER ROUGH)	$ 11.35	0.00
POWER EQUIPMENT OPERATOR (SCRAPER FINISH)	$ 12.71	0.00
POWER EQUIPMENT OPERATOR (ROLLER OTHER)	$ 11.36	0.00
POWER EQUIPMENT OPERATOR (ROLLER ASPHALT FINISH)	$ 13.85	0.00
POWER EQUIPMENT OPERATOR (ROLLER ASPHALT BREAKDOWN)	$ 12.45	0.00
POWER EQUIPMENT OPERATOR (PAVER CONCRETE)	$ 18.20	0.00
POWER EQUIPMENT OPERATOR (PAVER ASPHALT)	$ 15.59	0.00
POWER EQUIPMENT OPERATOR (PAVEMENT MARKING EQUIPMENT)	$ 12.11	0.00
POWER EQUIPMENT OPERATOR (OILER/GREASER)	$ 13.55	0.00
POWER EQUIPMENT OPERATOR (OFF-ROAD HAULER/WATER TANKER)	$ 11.36	0.00
POWER EQUIPMENT OPERATOR (MATERIAL TRANSFER VEHICLE (SHUTTLE BUGGY))	$ 15.18	0.00
POWER EQUIPMENT OPERATOR (LOADER GREATER THAN 2 CUBIC YARDS)	$ 14.14	0.00
POWER EQUIPMENT OPERATOR (LOADER 2 CUBIC YARDS OR LESS)	$ 13.76	0.00
POWER EQUIPMENT OPERATOR (GRADER/BLADE ROUGH)	$ 14.62	0.00
POWER EQUIPMENT OPERATOR (GRADER/BLADE FINE)	$ 18.47	0.00
POWER EQUIPMENT OPERATOR (EXCAVATOR ROUGH)	$ 14.00	0.00
POWER EQUIPMENT OPERATOR (EXCAVATOR FINE)	$ 16.60	0.00
POWER EQUIPMENT OPERATOR (DRILL OPERATOR STRUCTURE)	$ 21.14	0.00
POWER EQUIPMENT OPERATOR (DRILL OPERATOR ROCK)	$ 14.38	0.00
POWER EQUIPMENT OPERATOR (CRANE ROUGH/ALL TERRAIN)	$ 20.67	0.00
POWER EQUIPMENT OPERATOR (CRANE OTHER)	$ 20.08	0.00
POWER EQUIPMENT OPERATOR (CRANE BOOM TRUCKS)	$ 20.54	0.00
POWER EQUIPMENT OPERATOR (CONCRETE GRINDER/GROOVER)	$ 20.34	2.30
POWER EQUIPMENT OPERATOR (BULLDOZER ROUGH)	$ 14.34	0.00

POWER EQUIPMENT OPERATOR (BULLDOZER FINE).....$ 17.04 0.00
POWER EQUIPMENT OPERATOR (ASPHALT BROOM TRACTOR)....$ 11.85 0.00
PAINTER (BRIDGE).....$ 24.57 0.00
LABORER: PIPELAYER.....$ 12.17 0.00
LABORER: COMMON OR GENERAL.....$ 10.20 0.00
LABORER (TRAFFIC SIGNAL/LIGHTING INSTALLER).....$ 14.89 0.00
LABORER (GUARDRAIL/FENCE INSTALLER).....$ 12.87 0.00
LABORER (CEMENT MASON/CONCRETE FINISHER TENDER).....$ 12.54 0.00
LABORER (CARPENTER TENDER).....$ 12.88 0.00
LABORER (ASPHALT SCREED/JACKMAN).....$ 14.33 0.00
LABORER (ASPHALT RAKER AND SPREADER).....$ 12.46 0.00
IRONWORKER.....$ 16.02 0.00
ELECTRICIAN (TELECOMMUNICATIONS TECHNICIAN).....$ 16.79 0.63
ELECTRICIAN (ELECTRICIAN).....$ 17.97 0.00
CEMENT MASON/CONCRETE FINISHER.....$ 14.48 0.00
CARPENTER.....$ 13.72 0.00
BLASTER.....$ 21.04 0.00

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
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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.

Note: Executive Order 13658 generally applies to contracts subject
to the Davis-Bacon Act that were awarded on or between January 1,
2015 and January 29, 2022, and that have not been renewed or
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regardless of when they were awarded. If a contract is subject to
Executive Order 13658, the contractor must pay all covered workers
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WAGE DETERMINATION APPEALS PROCESS

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Wage and Hour Division
U.S. Department of Labor
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U.S. Department of Labor
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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.

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Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION
"

U.S. Department of Labor
Wage and Hour Division

Davis-Bacon and Related Acts Weekly Certified Payroll Form

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Unless otherwise noted, the information requested is specific to the named project below.

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division

Rev. January 2025
OMB No.: 1235-0008
Expires: 01/31/2028

☐ SUBMISSION OF FINAL DBRA CERTIFIED PAYROLL FORM ☐ PRIME CONTRACTOR ☐ SUBCONTRACTOR

PROJECT NAME	PROJECT NO. or CONTRACT NO.	CERTIFIED PAYROLL NO.	PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS NAME
PROJECT LOCATION	**WAGE DETERMINATION NO.**	**WEEK ENDING DATE**	**PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS ADDRESS**

(1A)	(1B)	(1C)	(1D)	(1E)	(2)	(3)		(4)		(5)		(6A)	(6B)	(6C)	(7A)	(7B)	(8)				(9)
WORKER ENTRY NO.	WORKER LAST NAME	WORKER FIRST NAME	WORKER MIDDLE INITIAL	WORKER IDENTIFYING NO.	(J) JOURNEYWORKER (RA) REGISTERD APPRENTICE	LABOR CLASSIFICATION		ST = STRAIGHT TIME OT = OVERTIME	(TOP) DAYS OF WORK WEEK (BOTTOM) DATES HOURS WORKED EACH DAY	TOTAL HOURS WORKED FOR WEEK		HOURLY WAGE RATE PAID FOR ST AND OT	TOTAL FRINGE BENEFIT CREDIT	PAYMENT IN LIEU OF FRINGE BENEFITS	GROSS AMT EARNED	GROSS AMT EARNED FOR **ALL WORK**	DEDUCTIONS FOR **ALL WORK**				NET PAY TO WORKER FOR **ALL WORK**
								ST									TAX WITH-HOLDINGS	FICA	OTHER (MUST SPECIFY, SEE INSTRUCTIONS)	TOTAL DEDUCTIONS	
								OT													
								ST													
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While use of Form WH-347 itself is optional, covered contractors and subcontractors performing work on Federal or federally assisted construction contracts are required by the DBRA regulations and the contract clauses to submit payroll information on a weekly basis. The Copeland Act (40 U.S.C. § 3145) requires contractors and subcontractors performing work on Federal or federally financed construction contracts to, on a weekly basis, "furnish a statement on the wages paid each employee during the prior week." U.S. Department of Labor (DOL) Regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors and subcontractors to submit weekly certified payrolls to the appropriate Federal agency if the agency is a party to the contract (or, if the agency is not such a party, to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to the Federal agency). Each certified payroll must be accompanied by a signed "Statement of Compliance" (e.g., page 2 of the WH-347 or another document with identical wording) indicating that the certified payrolls are accurate and complete, and that each laborer or mechanic has been paid not less than the required Davis-Bacon prevailing wage rate(s) (including any fringe benefits) for the work performed. DOL and contracting agencies receiving this information review the information to determine whether workers have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

PROJECT NAME	PROJECT NO. or CONTRACT NO.	PAYROLL NO.	PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS NAME
PROJECT LOCATION		**WEEK ENDING DATE**	**CERTIFYING OFFICIAL's NAME AND TITLE**

I paid or supervised the payment of the laborers or mechanics working on the above project during the stated time period. I certify the following:

☐ The payroll information submitted with this statement is correct and complete for the above project during the above period, and the wage and fringe benefit rates paid to the workers, including credit taken for the reasonably anticipated costs of a bona fide fringe benefit plan, fund or program, are not less than the applicable wage and fringe benefits rates for the classification(s) of work actually performed, as specified in the wage determination(s) incorporated into the contract.

☐ All regular payrolls and all other basic records that the contractor is required to maintain for this payroll period are complete and accurate and will be made available upon request from the agency or the Department of Labor.

☐ The classifications reported for each laborer or mechanic are the classification(s) of work that each worker actually performed.

☐ Any workers paid as apprentices during the above period are duly registered in a bona fide apprenticeship program registered with the Office of Apprenticeship, Employment and Training Administration, United States Department of Labor ("OA"), or a State Apprenticeship Agency ("SAA") recognized by Department of Labor. I have verified the registered apprenticeship program information provided below as accurate and applicable to any apprentices identified on page 1 of this form.

APPRENTICESHIP PROGRAM NAME	REGISTERED		NAME OF LABOR CLASSIFICATION
	☐ OA	☐ SAA	
	☐ OA	☐ SAA	
	☐ OA	☐ SAA	

☐ Fringe benefits have been paid in cash and/or to bona fide fringe benefit plans, funds, or programs. Where the contractor is claiming an hourly credit for their contributions to or reasonably anticipated costs of a bona fide fringe benefit plan, fund, or program, provide plan information and the hourly credit claimed for each worker listed on the previous page of this form.

HOURLY CREDIT FOR FRINGE BENEFITS

If an amount is listed in (6B) on the first page of this certified payroll form, enter the hourly credit claimed under each plan name, type and number for each worker and check whether the plan is funded or unfunded.

NAME OF WORKER	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded	TOTAL HOURLY CREDIT
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	$
	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hourly Credit $	Hrly Credit $	$

☐ All workers on the project have been paid the full weekly wages earned, and no rebates or deductions have been or will be made either directly or indirectly, other than permissible deductions as defined in 29 CFR part 3.

ADDITIONAL REMARKS

SIGNATURE OF CERTIFYING OFFICIAL	DATE	TELEPHONE NUMBER	EMAIL ADDRESS
		(___) ___ -____	

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION (SEE SECTION 1001 OF TITLE 18 AND SECTION 3729 OF TITLE 31 OF THE UNITED STATES CODE), AS WELL AS DEBARMENT FROM FUTURE FEDERAL AND FEDERALLY-ASSISTED CONTRACTS. INFORMATION REPORTED IN CERTIFIED PAYROLLS MAY BE SUBJECT TO DISCLOSURE IN RESPONSE TO A FREEDOM OF INFORMATION ACT REQUEST.

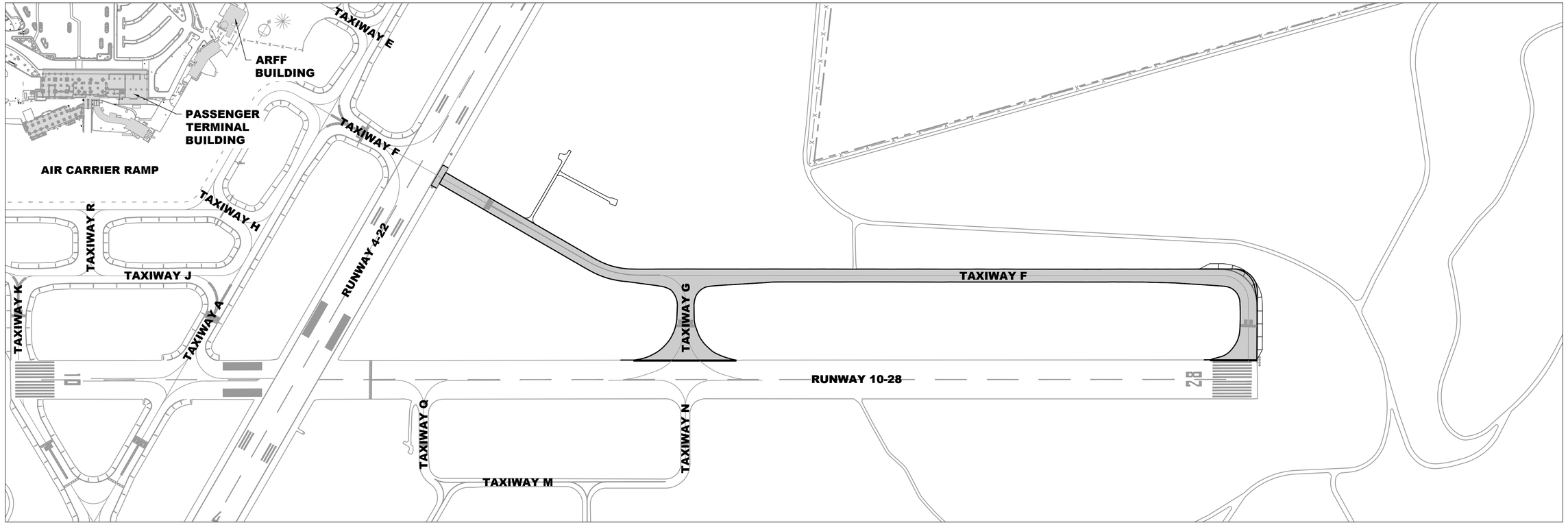
APPENDIX A — DRAWINGS

FAYETTEVILLE REGIONAL AIRPORT

CITY OF FAYETTEVILLE, NORTH CAROLINA

REHABILITATION OF TAXIWAYS FOXTROT AND GOLF

RS&H PROJECT NUMBER: 1003-1830-005



APRIL 2, 2026
BIDDING DOCUMENTS

CITY OF FAYETTEVILLE

AIRFIELD ELECTRICAL DRAWINGS BY:

WALLS ENGINEERING, PLLC
8226 CREEDMOOR ROAD, SUITE 201
RALEIGH, NC 27613
919-522-0628 | NC LICENSE NO. P-0618
www.we-engineering.com

CIVIL DRAWINGS BY:

RS&H ARCHITECTS-ENGINEERS-PLANNERS, INC.
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
PH (919) 926-4100
www.rsandh.com
NC LICENSE NOS. 50073 * F-0493 * C-28

CIVIL DRAWINGS

SHEET #	SHEET TITLE
C000	COVER SHEET
C001	INDEX OF DRAWINGS AND SUMMARY OF QUANTITIES
C011	SAFETY AND SECURITY NOTES AND DETAILS
C012	CONTRACTOR ACCESS PLAN
C013	PART 77 AIRSPACE PLAN
C014	CONTRACTOR PHASING PLAN
C015	TEMPORARY RUNWAY CLOSURE PLAN
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E105	ELECTRICAL DEMOLITION PLAN
E106	ELECTRICAL DEMOLITION PLAN
E201	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E202	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E203	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E204	ELECTRICAL LAYOUT AND CIRCUITING PLAN
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E301	ELECTRICAL DETAILS
E302	ELECTRICAL DETAILS
E303	ELECTRICAL DETAILS
E304	ELECTRICAL DETAILS
E305	ELECTRICAL DETAILS
E306	ELECTRICAL DETAILS
E307	ELECTRICAL DETAILS
E308	ELECTRICAL DETAILS

SUMMARY OF QUANTITIES

ITEM NO.	ITEM DESCRIPTION	AIP ELIGIBLE	NON-AIP ELIGIBLE	TOTAL QUANTITY	UNIT
	CIVIL QUANTITIES				
C-100-1	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	1	1	2	LS
C-105-1	MOBILIZATION	1	1	2	LS
GP-102-1	SAFETY AND SECURITY	1	1	2	LS
GP-103-1	TEMPORARY CONSTRUCTION ITEMS	1	1	2	LS
P-101-1	ASPHALT SHOULDER FULL DEPTH PAVEMENT REMOVAL (1.5-INCH DEPTH)	0	1,100	1,100	SY
P-101-2	VEHICLE SERVICE ROAD FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	430	0	430	SY
P-101-3	ASPHALT TAXIWAY FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	0	625	625	SY
P-101-4	COLD MILLING	10,270	14,500	24,770	SY
P-101-5	MILLINGS PLACEMENT FOR RADAR ROAD (COMPACTED IN PLACE)	14,040	0	14,040	SY
P-101-6	CONCRETE FLUME REMOVAL	0	140	140	SY
C-102-1	TEMPORARY SEEDING AND MULCHING	425	2,490	2,915	SY
C-102-2	INSTALLATION AND REMOVAL OF COMPOST SOCK	0	700	700	LF
C-102-3	INSTALLATION AND REMOVAL OF ROCK PIPE INLET PROTECTION	0	1	1	EA
C-102-4	INSTALLATION AND REMOVAL OF DROP INLET PROTECTION	1	1	2	EA
D-701-1	18-INCH CORRUGATED METAL PIPE	35	0	35	LF
P-152-1	UNCLASSIFIED EXCAVATION	0	125	125	CY
P-152-2	UNSUITABLE EXCAVATION	0	25	25	CY
P-152-3	SUBGRADE PREPARATION	0	890	890	SY
P-209-1	CRUSHED AGGREGATE BASE COURSE (5-INCH DEPTH)	0	890	890	SY
P-401-1	ASPHALT SURFACE COURSE (GRADATION 2)	3,390	5,080	8,470	TN
P-401-2	ASPHALT LEVELING COURSE (GRADATION 3)	20	5	25	TN
P-602-1	EMULSIFIED ASPHALT PRIME COAT	5,140	7,700	12,840	GA
P-603-1	EMULSIFIED ASPHALT TACK COAT	890	1,250	2,140	GA
P-620-1	SURFACE PREPARATION	3,372	322	3,694	SF
P-620-2	WHITE REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	200	100	300	SF
P-620-3	WHITE REFLECTIVE MARKING (TYPE III WATERBORNE PAINT)	1,190	2,630	3,820	SF
P-620-4	YELLOW REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	1,650	1,580	3,230	SF
P-620-5	RED REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	830	310	1,140	SF
P-620-6	BLACK NON-REFLECTIVE MARKING (TYPE I WATERBORNE PAINT, NO GLASS BEADS)	6,360	7,760	14,120	SF
P-620-7	TYPE I GLASS BEADS, GRADATION A, REFLECTIVE MEDIA	51	19	70	LB
P-620-8	TYPE III GLASS BEADS, REFLECTIVE MEDIA	274	346	620	LB
T-901-1	SEEDING	0.10	0.30	0.4	AC
T-905-1	TOPSOIL OBTAINED ON SITE	24	115	139	CY
T-904-1	SODDING	35	760	795	SY
T-908-1	MULCHING	395	1,314	1,709	SY
	ELECTRICAL QUANTITIES				
L-105-1	REMOVE EXISTING STAKE MOUNTED LIGHT FIXTURE	35	34	69	EA
L-105-2	REMOVE EXISTING BASE MOUNTED LIGHT FIXTURE AND BASE CAN	2	10	12	EA
L-105-3	REMOVE EXISTING IN-PAVEMENT LIGHT FIXTURE AND BASE CAN IN MILL/OVERLAY PAVEMENT	1	1	2	EA
L-105-4	REMOVE EXISTING SIGN AND FOUNDATION	4	4	8	EA
L-105-5	MISCELLANEOUS ELECTRICAL DEMOLITION	1	1	2	LS
L-108-1	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS (INITIAL AND SUPPLEMENTAL) AND GROUND CONNECTORS	4155	6100	10255	LF
L-108-2	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE	7800	6800	14600	LF
L-110-1	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED IN TURF	3500	5900	9400	LF
L-110-2	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED UNDER MILL/OVERLAY PAVEMENT	30	0	30	LF
L-110-3	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – CONCRETE ENCASED UNDER MILL/OVERLAY PAVEMENT	75	100	175	LF
L-110-4	2 WAY 2-INCH SCHEDULE 40 PVC CONDUIT - DIRECT EARTH BURIED	550	100	650	LF
L-110-5	2 WAY 2-INCH SCHEDULE 80 HDPE DIRECTIONAL DRILL	400	0	400	LF
L-115-1	JUNCTION CAN PLAZA - 2 L-867D BASE CANS	4	2	6	EA
L-125-1	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN TURF	40	49	89	EA
L-125-2	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN MILL/OVERLAY PAVEMENT	2	0	2	EA
L-125-3	REINSTALL EXISTING IN-PAVEMENT LIGHT FIXTURE ON NEW BASE CAN IN MILL/OVERLAY PAVEMENT	1	1	2	EA
L-125-4	L-858(L) LED SIGN, 1-MODULE ON A NEW CONCRETE SIGN BASE	1	2	3	EA
L-125-5	L-858(L) LED SIGN, 2-MODULE ON A NEW CONCRETE SIGN BASE	2	0	2	EA
L-125-6	L-858(L) LED SIGN, 3-MODULE ON A NEW CONCRETE SIGN BASE	1	2	3	EA
L-125-7	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE	1	1	2	LS

ABBREVIATIONS

ABC - AGGREGATE BASE COURSE
ADG - AIRPLANE DESIGN GROUP
AOA - AIRCRAFT OPERATIONS AREA
APPROX. - APPROXIMATE
ARFF - AIRCRAFT RESCUE AND FIREFIGHTING
ASTM - AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATCT - AIR TRAFFIC CONTROL TOWER
BOP - BOTTOM OF PIPE
BOD - BOTTOM OF DUCT
BOTT. - BOTTOM
CL/C- CENTERLINE
C - CONDUIT
CF - CUBIC FOOT
CKT - CIRCUIT
CLR - CLEARANCE
COM - COMMUNICATION
CONC - CONCRETE
CONN - CONNECTION
CONT - CONTINUOUS
CSSO - CONTRACTOR SAFETY AND SECURITY OFFICER
CY - CUBIC YARD
DBL - DOUBLE
DET - DETAIL
DIA - DIAMETER
DIAG. - DIAGONAL
DWG - DRAWING
E - EASTING
EA - EACH
EG - EXISTING GROUND
ELB - ELECTRIC SERVICE BOX/METER
EL/ELEV - ELEVATION
ELEC - ELECTRICAL
EMH - ELECTRIC MANHOLE
EOP - EDGE OF PAVEMENT
EX/EXST/EXIST - EXISTING
FAA - FEDERAL AVIATION ADMINISTRATION
FOD - FOREIGN OBJECT DEBRIS
FAR - FEDERAL AVIATION REGULATIONS
GL - GUTTER LINE
GND. - GROUND
GSE - GROUND SERVICE EQUIPMENT
GWL - GROUND WATER LEVEL
HORT - HORIZONTAL
I/C - NUMBER OF CONDUCTORS/CONDUCTOR
ID - IDENTIFICATION
I.D. - INNER DIAMETER
IE/INV - INVERT ELEVATION / INVERT
KIP - 1,000 LBS
kV - KILOVOLT
L - LIGHTING
LB - POUND
LED - LIGHT-EMITTING DIODE
LF - LINEAR FEET
LT - LEFT
MAX - MAXIMUM
MECH - MECHANICAL
MH - MANHOLE
MIN - MINIMUM
N - NORTHING
NAD - NORTH AMERICAN DATUM
NAVAIDS - NAVIGATIONAL AIDS
NLVR - NON-LICENSED VEHICLE ROAD
NO - NUMBER
NTP - NOTICE TO PROCEED
NTS - NOT TO SCALE
OC - ON CENTER
OD - OUTER DIAMETER
OFA - OBJECT FREE AREA
PAVT - PAVEMENT
PC - POINT OF CURVATURE
PCC - PORTLAND CEMENT CONCRETE
PERF - PERFORATED
PG - PROPOSED GRADE
PL - PLATE
PSF - POUNDS PER SQUARE FOOT
PSI - POUNDS PER SQUARE INCH
PT - POINT OF TANGENCY
PVI - POINT OF VERTICAL INTERSECTION
RCP - REINFORCED CONCRETE PIPE
REF - REFERENCE
REINF - REINFORCED
REQ/REQ'D - REQUIRED
RGL - RUNWAY GUARD LIGHTS
RIM - RIM ELEVATION
RON - REMAIN OVERNIGHT
RPZ - RUNWAY PROTECTION ZONE
RSA - RUNWAY SAFETY AREA
RT - RIGHT
RW - RUNWAY
S/SAN - SANITARY
SA - SAFETY AREA
SC - SECONDARY CONTAINMENT
SCH/SCHED - SCHEDULE
SD - STORM DRAIN
SDMH - STORM DRAIN MANHOLE
SHT - SHEET
SIDA - SECURITY IDENTIFICATION DISPLAY AREA
SF - SQUARE FOOT
STA - STATION
SW - SINGLE WALL
SY - SQUARE YARD
TBR - TO BE REMOVED
TDG - TAXIWAY DESIGN GROUP
TEL - TELEPHONE
TEMP - TEMPORARY
THK - THICK
T/L - TAXILANE
T.O. - TOP OF
TOC - TOP OF CONCRETE
TOD - TOP OF DUCT
TOFA - TAXIWAY OBJECT FREE AREA
TSA - TAXIWAY SAFETY AREA OR
TRANSPORTATION SECURITY ADMINISTRATION
TW - TAXIWAY
TYP - TYPICAL
UD - UNDERDRAIN
UG - UNDERGROUND
VA - VOLT-AMPS
VERT - VERTICAL
VSR - VEHICLE SERVICE ROAD
W - WATER
W/ - WITH
W/O - WITHOUT
YI - YARD INLET
YL - YARD LIGHT

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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INDEX OF DRAWINGS AND SUMMARY OF QUANTITIES

SHEET NUMBER

C001

BIDDING DOCUMENTS

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CONTRACTOR'S SAFETY AND SECURITY REQUIREMENTS

SAFETY

1. THE TERM "CONTRACTOR" MEANS THE PRIME CONTRACTOR, HIS/HER SUBCONTRACTORS, SUPPLIERS, MATERIAL, MEN, EMPLOYEES, AND OTHERS WHO WILL PERFORM SERVICES FOR OR IN CONJUNCTION WITH THE PRIME CONTRACTOR. THE TERM "OWNER" MEANS THE CITY OF FAYETTEVILLE AND AUTHORIZED REPRESENTATIVES OF THE CITY, OR AIRPORT MAINTENANCE PERSONNEL. THE TERM "AIRPORT OPERATOR" IS DEFINED AS THE FAYETTEVILLE REGIONAL AIRPORT OPERATIONS PERSONNEL. THE TERM RPR REFERS TO THE INDIVIDUAL REPRESENTING THE OWNER IN THE FIELD.

2. THE CONTRACTOR SHALL ACQUAINT THEIR SUPERVISORS AND EMPLOYEES OF THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO FAYETTEVILLE REGIONAL AIRPORT (FAY) AND SHALL CONDUCT THE CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY AS SPECIFIED IN SAFETY NOTE 11. CONTRACTOR SHALL SUBMIT A SAFETY PLAN TO THE OWNER WHICH WILL BE MONITORED ACCORDINGLY. CONSTRUCTION SHALL NOT COMMENCE UNTIL THIS PLAN IS APPROVED BY THE AIRPORT OPERATOR.

3. ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT IN OR NEAR THE ACTIVE AIRCRAFT OPERATIONS AREA (AOA) SHALL BE REQUIRED TO:

   3.1. DISPLAY AN APPROVED PERMANENT COMPANY LOGO ON BOTH SIDES OF THE VEHICLE
   3.2. DISPLAY IN FULL VIEW A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT
   3.3. IF FLASHING AMBER (YELLOW) DOME-TYPE LIGHT IS NOT DISPLAYED, VEHICLES SHALL DISPLAY A 3' X 3' OR LARGER ORANGE AND WHITE CHECKERBOARD FLAG. EACH CHECKERBOARD COLOR SHALL BE 1-FOOT SQUARE, (SEE CONSTRUCTION SAFETY FLAG DETAIL 2/ THIS SHEET), AND ESCORTED UNDER THE CONTROL OF ONE CONTRACTOR MOBILE (TWO-WAY) RADIO OPERATOR ON THE JOB AT ALL TIMES. USE OF A ORANGE AND WHITE CHECKERBOARD FLAG IS ONLY PERMITTED DURING DAYLIGHT HOURS (SEE BELOW).

   THE AOA IS DEFINED AS ANY AREA OF THE AIRPORT USED OR INTENDED TO BE USED FOR THE LANDING, TAKEOFF, OR SURFACE MANEUVERING OF AIRCRAFT. ANY VEHICLE OPERATING IN OR NEAR THE ACTIVE AOA DURING THE HOURS OF DARKNESS SHALL BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME LIGHT, MOUNTED ON TOP OF THE VEHICLE AND BE OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES. ALL RADIO EQUIPPED VEHICLES SHALL COORDINATE AIR TRAFFIC CONTROL TOWER CALL SIGNS WITH AIRPORT OPERATIONS PRIOR TO OPERATING ONSITE. THE CONTRACTOR, THROUGH THE DESIGNATED CONTRACTOR'S SECURITY AND SAFETY OFFICER (CSSO), SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUBCONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE.

4. WHEN ANY VEHICLE, OTHER THAN THOSE HAVING PRIOR APPROVAL FROM THE AIRPORT OPERATOR, MUST TRAVEL OVER ANY PORTION OF AN AIRCRAFT MOVEMENT AREA, IT MUST BE ESCORTED BY AN APPROVED VEHICLE WITH BADGE CREDENTIALS.

5. ALL CONSTRUCTION VEHICLES MUST BE EQUIPPED WITH A RADIO CAPABLE OF COMMUNICATING WITH AIR TRAFFIC CONTROL AND PROPERLY IDENTIFIED. SEE NOTE 13.

6. NO RUNWAY, TAXIWAY, APRON OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF THE AIRPORT OPERATOR. TO ENABLE NECESSARY "NOTICES TO AIRMEN" (NOTAM) OR ADVISORIES TO AIRPORT SERVICES OR TENANTS, A MINIMUM OF 7 BUSINESS DAYS WRITTEN NOTICE REQUESTING CLOSING SHALL BE DIRECTED TO THE RPR WHO WILL COORDINATE THE REQUEST WITH THE AIRPORT OPERATOR. OWNER PROVIDED LIGHTED X'S SHALL BE PLACED AT BOTH ENDS OF THE RUNWAY PRIOR TO RUNWAY CLOSURE. THE CONTRACTOR IS TO COORDINATE WITH THE RPR AND THE AIRPORT OPERATOR.

7. STOCKPILED MATERIAL SHALL BE CONSTRAINED IN A MANNER TO PREVENT MOVEMENT RESULTING FROM AIRCRAFT JET BLAST OR WIND CONDITIONS IN EXCESS OF TWENTY MILES PER HOUR. MAX STOCKPILE HEIGHT OF 15' IN DESIGNATED AREAS ONLY AS SHOWN ON THE PLANS. IN ADDITION, STOCKPILED MATERIAL SHALL HAVE SILT FENCE LOCATED AROUND THE MATERIAL TO PREVENT FOREIGN OBJECT DEBRIS (FOD) FROM MOVING ONTO THE AIRFIELD PAVEMENTS OR POLLUTING WATERCOURSES. SEE EROSION CONTROL DETAILS.

8. OPEN TRENCHES, EXCAVATIONS AND STOCKPILED MATERIAL LOCATED IN OR NEAR THE AOA SHALL BE PROMINENTLY MARKED WITH APPROVED FLAGS AND LOW-PROFILE BARRICADES AND LIGHTED BY APPROVED LIGHT UNITS DURING HOURS OF RESTRICTED VISIBILITY AND DARKNESS.

9. DEBRIS, WASTE AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS OR BEING INGESTED IN JET ENGINES SHALL NOT BE ALLOWED ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS. IF THESE MATERIALS ARE OBSERVED TO BE ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS, THEY WILL BE REMOVED IMMEDIATELY AND CONTINUOUSLY DURING CONSTRUCTION. IF THESE MATERIALS ARE OBSERVED AT ANYTIME, THE CONTRACTOR SHALL REMOVE THEM IMMEDIATELY. A BROOM TRUCK AND VACUUM TRUCK (SAFETY NOTE 14) SHALL BE AVAILABLE AT ALL TIMES DURING THE PROJECT TO IMMEDIATELY REMOVE DUST, DEBRIS, OR FOD.

10. THE CONTRACTOR IS DIRECTED TO COMPLY WITH AND ACQUAINT HIS/HER EMPLOYEES WITH THE FOLLOWING SAFETY GUIDELINES, RELATED MATERIALS AND MOST RECENTLY PUBLISHED FAA ADVISORY CIRCULARS, LATEST EDITION:

    150/5200-18 "AIRPORT SAFETY SELF-INSPECTION"
    150/5210-5 "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AN AIRPORT"
    150/5370-2 "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"

    COPIES OF THESE DOCUMENTS ARE AVAILABLE ONLINE AT:
    HTTP://WWW.FAA.GOV/AIRPORTS/RESOURCES/ADVISORY_CIRCULARS/

11. THE CONTRACTOR SHALL PREPARE SAFETY PLANS SPECIFIC TO 1) DAYTIME AND NIGHTTIME CONSTRUCTION OPERATIONS, AS WELL AS A 2) CONTINGENCY PLAN TO ADDRESS CASES OF ABNORMAL FAILURES OR UNEXPECTED DISASTERS.

12. HAUL ROUTES ON THE AIRFIELD SHALL BE DELINEATED WITH LIGHTED LOW-PROFILE BARRICADES (SEE LOW PROFILE BARRICADE DETAIL 1/ THIS SHEET) AT LOCATIONS INDICATED ON THE CONTRACT DOCUMENTS. OTHER MEANS TO CLEARLY MARK THE ROUTES TO THE WORK SITE MAY BE APPROVED ONLY BY THE RPR, ENGINEER AND/OR THE AIRPORT OPERATOR.

13. ALL COMMUNICATION WITH THE AIR TRAFFIC CONTROL TOWER OR OTHER ELEMENTS OF THE AIRPORT SHALL BE THROUGH THE RPR AND AIRPORT OPERATOR.

14. THE CONTRACTOR SHALL HAVE A BROOM TRUCK AND VACUUM TRUCK IN GOOD WORKING ORDER READILY AVAILABLE FOR THE DURATION OF THE PROJECT TO CONTINUOUSLY VACUUM ALL PAVEMENTS AFFECTED BY CONSTRUCTION.

15. NO PERSONNEL MAY OPERATE VEHICLES AIRSIDE UNLESS 1) THEY HAVE FIRST COMPLETED AND PASSED AN AIRPORT APPROVED DRIVERS TRAINING CLASS, OR 2) THEY ARE UNDER ESCORT BY BADGED AND PERMITTED PERSONNEL AT ALL TIMES. AIRSIDE IS DESCRIBED AS ANY AREA INSIDE THE SECURITY FENCING. ALL PERSONNEL OPERATING VEHICLES ONSITE AND/OR COMMUNICATING WITH THE ATCT MUST ATTEND AND COMPLETE THE AIRPORT'S DRIVER TRAINING COURSE PRIOR TO OPERATING VEHICLES ONSITE.

16. THE CONTRACTOR SHALL INSTALL ALL REQUIRED BARRICADES AT DESIGNATED PLAN LOCATIONS. ALL THESE ITEMS SHALL CONSIST OF THE SAFETY AND SECURITY SYSTEM. THE CONTRACTOR SHALL INSTALL THE COMPONENTS OF THE SYSTEM AT THE APPROPRIATE TIMES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSPECT EVERY ASPECT OF THE SAFETY AND SECURITY SYSTEM ON A DAILY BASIS AND ENSURE ALL COMPONENTS ARE FUNCTIONING PROPERLY. THE RPR SHALL ALSO INSPECT THE SYSTEM DAILY AND ISSUE CORRECTIVE ACTION IF NECESSARY. THE SYSTEM ELEMENTS TO BE INSPECTED AND DEFICIENCIES NOTED ARE AS FOLLOWS:

    - BARRICADES SET PROPERLY AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY.
    - ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES MANNED AND COMMUNICATION AND SECURITY PROCEDURES IN PLACE.
    - ALL EQUIPMENT FLAGGED OR OUTFITTED WITH FLASHING AMBER DOME-TYPE LIGHTS.
    - CONTRACTOR USE OF UNAUTHORIZED AIRPORT ACCESS GATES CHECKED.
    - INSTALLATION OF ALL TEMPORARY TAXIWAY OR RUNWAY LIGHTING AND/OR SIGNAGE.

    ANY OF THE ABOVE SAFETY AND SECURITY ITEMS FOUND TO BE DEFICIENT AT THE BEGINNING OF THE DAY SHALL RESULT IN THAT DAY'S PRORATED SAFETY AND SECURITY BID ITEM AMOUNT DEDUCTED PERMANENTLY FROM THE CONTRACTOR'S EARNINGS.

17. THE CONTRACTOR SHALL COORDINATE WITH THE RPR TO ENSURE ALL RUNWAY AND TAXIWAY LIGHTS, SIGNAGE, NAVIGATIONAL AIDS, AND PAVEMENT SENSOR SYSTEMS, WITHIN OR DIRECTING AIRFIELD TRAFFIC TO CLOSED PORTIONS OF THE AIRFIELD, ARE DE-ENERGIZED PRIOR TO CONSTRUCTION.

SECURITY

1. GENERAL INTENT: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN. THE CONTRACTOR SHALL DESIGNATE TO THE RPR AND AIRPORT OPERATOR, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY & SAFETY OFFICER (CSSO)." THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT. THE CSSO SHALL PROVIDE TELEPHONE NUMBERS WHICH ALLOW THE RPR AND/OR THE AIRPORT OPERATOR THE ABILITY TO CONTACT THE CSSO 24 HOURS A DAY.

2. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA.

3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY THE OWNER. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE OR GUIDED BY AUTHORIZED CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE, AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ON THE SITE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL FOLLOW THE DESIGNATIONS WITHIN THE PLANS OR AS DIRECTED BY THE AIRPORT OPERATOR. THE CONTRACTOR SHALL DAISY CHAIN ALL PERMANENT AND TEMPORARY ACCESS GATES TO THE PROJECT SITE AND STAGING AREAS.

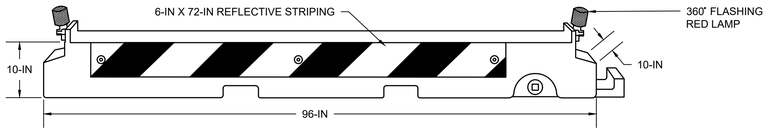
4. CONSTRUCTION AREA LIMITS: THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, PLANT SITE, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR. THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS SUITABLE FENCING, MARKING AND WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS WILL BE REQUIRED AT CRITICAL ACCESS POINTS. TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.

5. IDENTIFICATION - PERSONNEL: THE FAYETTEVILLE REGIONAL AIRPORT RESERVES THE RIGHT TO REQUIRE AIRPORT BADGING FOR CONTRACTOR'S EMPLOYEES DURING THE COURSE OF THIS CONSTRUCTION PROJECT. CONTRACTOR SHALL COMPLY WITH ALL BADGING REQUIREMENTS SET FORTH IN CONTRACT SPECIAL CONDITIONS. SEE CONTRACT SPECIAL CONDITIONS FOR BADGING AND ESCORT REQUIREMENTS.

6. FINES: PAYMENT OF ALL FINES ASSESSED TO FAYETTEVILLE REGIONAL AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA REGULATIONS OR SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

7. VEHICLE PARKING: CONTRACTOR EMPLOYEE VEHICLES SHALL BE RESTRICTED TO THE CONTRACTOR'S EMPLOYEE PARKING AREA AND ARE NOT ALLOWED ON THE AOA AT ANY TIME. SEE SHEET C012 FOR CONTRACTOR EMPLOYEE PARKING LOCATIONS.

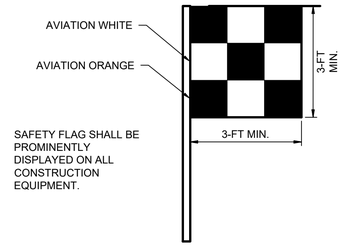
8. GATE ACCESS: ALL DRIVERS ENTERING THROUGH AOA ACCESS POINTS MUST BE BADGED BY THE AIRPORT OPERATOR. ARRANGEMENTS SHOULD BE MADE TO COORDINATE WITH THE AIRPORT OPERATIONS STAFF TO ESCORT UNBADGED CONSTRUCTION EMPLOYEES THROUGH THE ACCESS POINT.



1 LOW PROFILE BARRICADE DETAIL

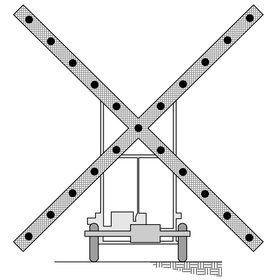
NTS

1. LOW LEVEL LIGHTED BARRICADES SHALL BE INSTALLED ACROSS PAVED AREAS ADJACENT TO AOA AT 4-FT MAX. SPACING OR AS DIRECTED. SEE PHASING PLAN FOR LOCATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING TOTAL NUMBER OF NECESSARY BARRICADES FOR INTENDED CONSTRUCTION OPERATIONS, AND SHALL PROVIDE ADEQUATE NUMBER TO ENSURE REQUIRED SAFETY. CONTRACTOR SHALL BE RESPONSIBLE TO MOVE, RELOCATE AND STORE BARRICADES DURING CONSTRUCTION CONTRACT TIME. THE BARRICADES SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT THE END OF THE PROJECT.
3. BARRICADE LIGHT SHALL BE RED, SOLAR POWERED MODEL OR APPROVED EQUAL. LIGHTS MUST BE MOUNTED ON BARRICADES AND SPACED AT NO MORE THAN 10-FT. LIGHTS MUST BE EITHER STEADY BURNING OR FLASHING, AND MUST MEET THE LUMINANCE REQUIREMENTS OF THE STATE HIGHWAY DEPARTMENT.
4. PAYMENT FOR BARRICADES AND BARRICADE PLACEMENT SHALL BE MADE UNDER TEMPORARY CONSTRUCTION ITEMS.



2 CONSTRUCTION FLAG DETAIL

NTS

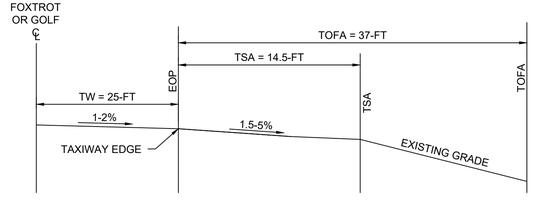


3 RUNWAY CLOSURE LIGHTED X DETAIL

NTS

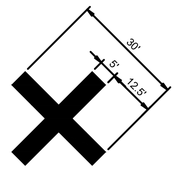
LIGHTED X NOTES:

1. CONTRACTOR SHALL PLACE, OWNER PROVIDED, LIGHTED RUNWAY CLOSURE MARKERS. PLACEMENT OF LIGHTED "X" SHALL BE INCIDENTAL TO TEMPORARY CONSTRUCTION ITEMS.
2. RUNWAY CLOSURE LIGHTED "X" SHALL BE PLACED OVER THE RUNWAY DESIGNATION NUMERALS OF THE CLOSED RUNWAY. LIGHTED "X" MUST BE ILLUMINATED AT ALL TIMES THAT IT IS ON A RUNWAY.
3. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN, INSTALL, FUEL AND REMOVE LIGHTED CLOSURE MARKERS. ANY REPAIRS REQUIRED TO THE MARKERS SHALL BE PERFORMED IMMEDIATELY SUCH THAT THE LIGHTED RUNWAY CLOSURE MARKERS FUNCTION CONTINUOUSLY DURING THE PROJECT WITHOUT INTERRUPTION. ALL REPAIRS SHALL BE AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COMPENSATION. PAYMENT FOR MAINTAINING, MOVING, AND FUEL OF RUNWAY CLOSURE MARKERS SHALL BE MADE UNDER TEMPORARY CONSTRUCTION ITEMS.

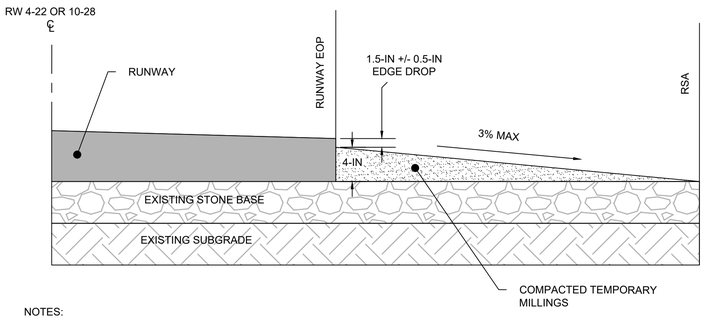


4 TSA AND OFA REQUIREMENTS

NTS



TAXIWAY CLOSURE MARKER



NOTES:

1. CONTRACTOR SHALL INSTALL TEMPORARY MILLINGS RAMP WHEN THE RUNWAY IS ACTIVE. INSTALLATION OF RAMP AND TIME NEEDED TO INSTALL MUST BE INCORPORATED WITHIN THE RUNWAY CLOSURE TIME. NO ADDITIONAL TIME WILL BE GIVEN TO ACCOMMODATE INSTALLATION.
2. PAYMENT FOR LABOR, EQUIPMENT USE, CONSTRUCTION OF COMPACTED TEMPORARY MILLINGS, AND REMOVAL/RELOCATION ON RADAR ROAD SHALL BE INCIDENTAL TO THE MILLINGS PLACEMENT ON RADAR ROAD PAY ITEM.

5 TEMPORARY MILLINGS RAMP

NTS

NOTES

1. TAXIWAY CLOSURE MARKERS SHALL BE PROVIDED AND MAINTAINED BY THE CONTRACTOR AS AN INCIDENTAL TO C-105-1 TEMPORARY CONSTRUCTION ITEMS. NO SEPARATE PAYMENT SHALL BE MADE FOR RUNWAY AND TAXIWAY CLOSURE MARKERS. MARKERS SHALL BE YELLOW AND CONSTRUCTED OF VINYL OR A MATERIAL APPROVED BY THE RPR. SUBMIT MATERIALS, SPECIFICATIONS, DIMENSIONS, AND SECURING METHODS TO THE RPR FOR APPROVAL.
2. THE CLOSURE MARKERS SHALL BE PROPERLY WEIGHTED WITH YELLOW COLORED WEIGHTS, SUCH AS SANDBAGS, TO THE PAVEMENT TO PREVENT DISLOCATION FROM THE WIND. THE RPR SHALL APPROVE THE CONTRACTOR'S METHODS TO PROPERLY WEIGH THE VINYL X TO THE PAVEMENT. THE NUMBER OF WEIGHTS REQUIRED SHALL BE DETERMINED BY THE CONTRACTOR TO PROPERLY WEIGHT THE VINYL X TO THE PAVEMENT.
3. TAXIWAY CLOSURE MARKINGS SHALL BE INSPECTED DAILY TO ENSURE THEY ARE CLEAN AND PROPERLY WEIGHTED DOWN. CONTRACTOR SHALL ENSURE YELLOW X'S MAINTAIN THEIR COLOR THROUGHOUT DURATION OF THE PROJECT AND DO NOT BECOME DISCOLORED THROUGH APPLICATION OF TACK COAT OR OTHER PAVING OPERATIONS.

6 TAXIWAY CLOSURE MARKING

NTS

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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

SAFETY AND SECURITY NOTES AND DETAILS

SHEET NUMBER

C011

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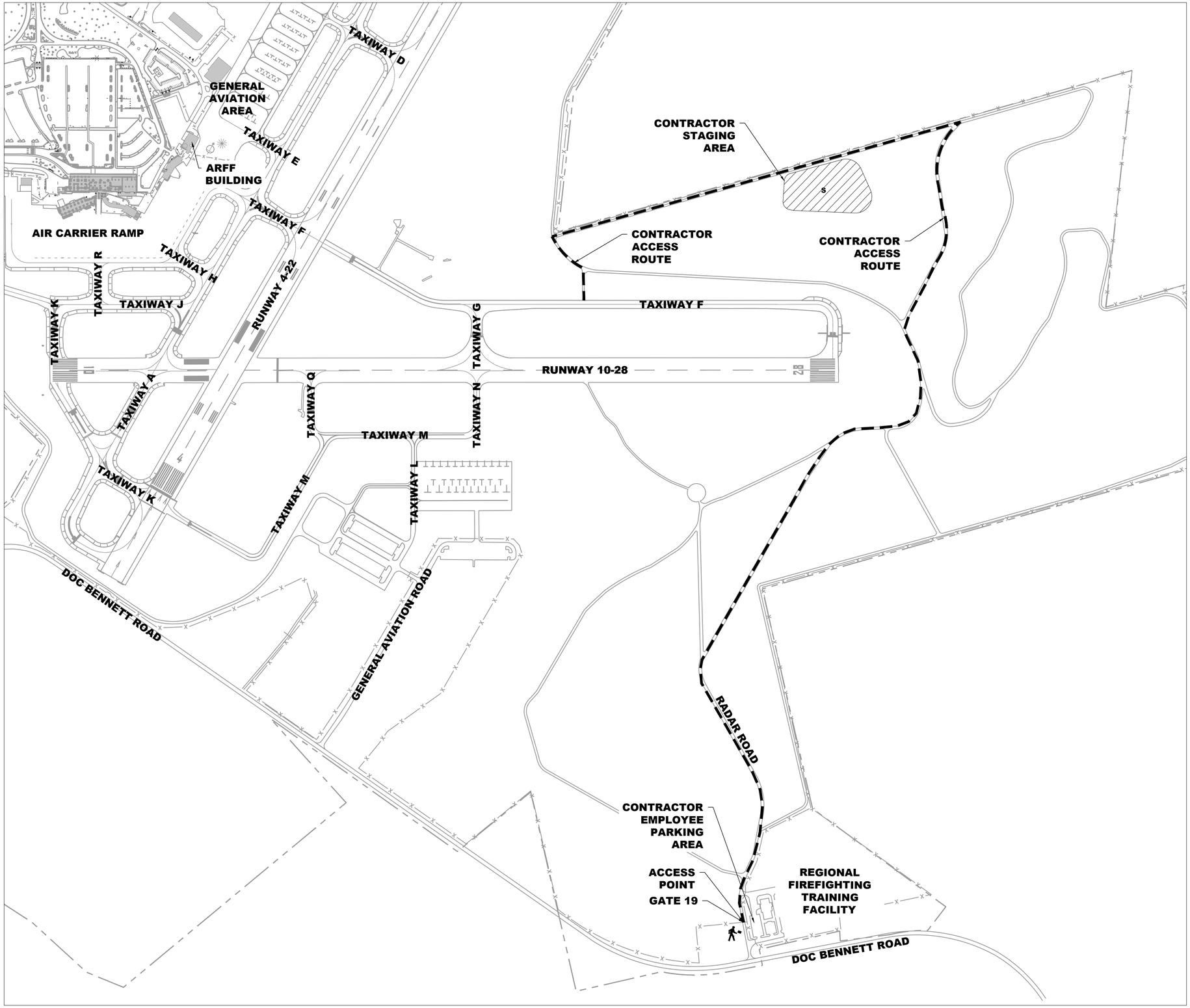

LEGEND

- S — STAGING AREA
- ACCESS ROUTE
- CONTRACTOR SUPPLIED GATE GUARD
- AOA FENCE
- AIRPORT PROPERTY LIMITS

NOTES

1. GATE ACCESS SHALL BE LIMITED TO BADGED PERSONNEL.
2. FOR PERIODS WHEN THE GATE MUST BE ACCESSED CONTINUOUSLY THROUGHOUT THE PROJECT SCHEDULE, THE CONTRACTOR MAY PROVIDE A GATE GUARD TO BE STATIONED AT GATE 19. THE GATE GUARD WILL BE INCIDENTAL TO THE "SAFETY & SECURITY" PAY ITEM.
3. THE CONTRACTOR WILL PLACE SIGNAGE AS DIRECTED HERE, DIRECTING TRAFFIC ALONG THE ACCESS ROAD. ALL SIGNAGE SHALL BE INCIDENTAL TO THE "TEMPORARY CONSTRUCTION" PAY ITEM.
4. THE CONTRACTOR IS NOT PERMITTED, UNLESS DIRECTED BY THE OWNER, TO DEVIATE FROM THIS ACCESS PLAN.
5. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER.

NORTH

300 0 300 600

SCALE (IN FEET)

1 INCH = 300 FEET (WHEN PRINTED 34"x22")

WARNING!!!! WARNING!!!! THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES, AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUND CABLES AND PIPES TRAVERSING THE AIRFIELD PAVEMENT AREAS. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO STARTUP OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY ITEM DAMAGE, CAUSED BY HIS ACTIONS, WITH NO ADDITIONAL COMPENSATION. WARNING!!!!

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FAYETTEVILLE REGIONAL AIRPORT

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DRAWN BY:	ERG
REVIEWED BY:	AEB

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CONTRACTOR ACCESS PLAN

SHEET NUMBER

C012

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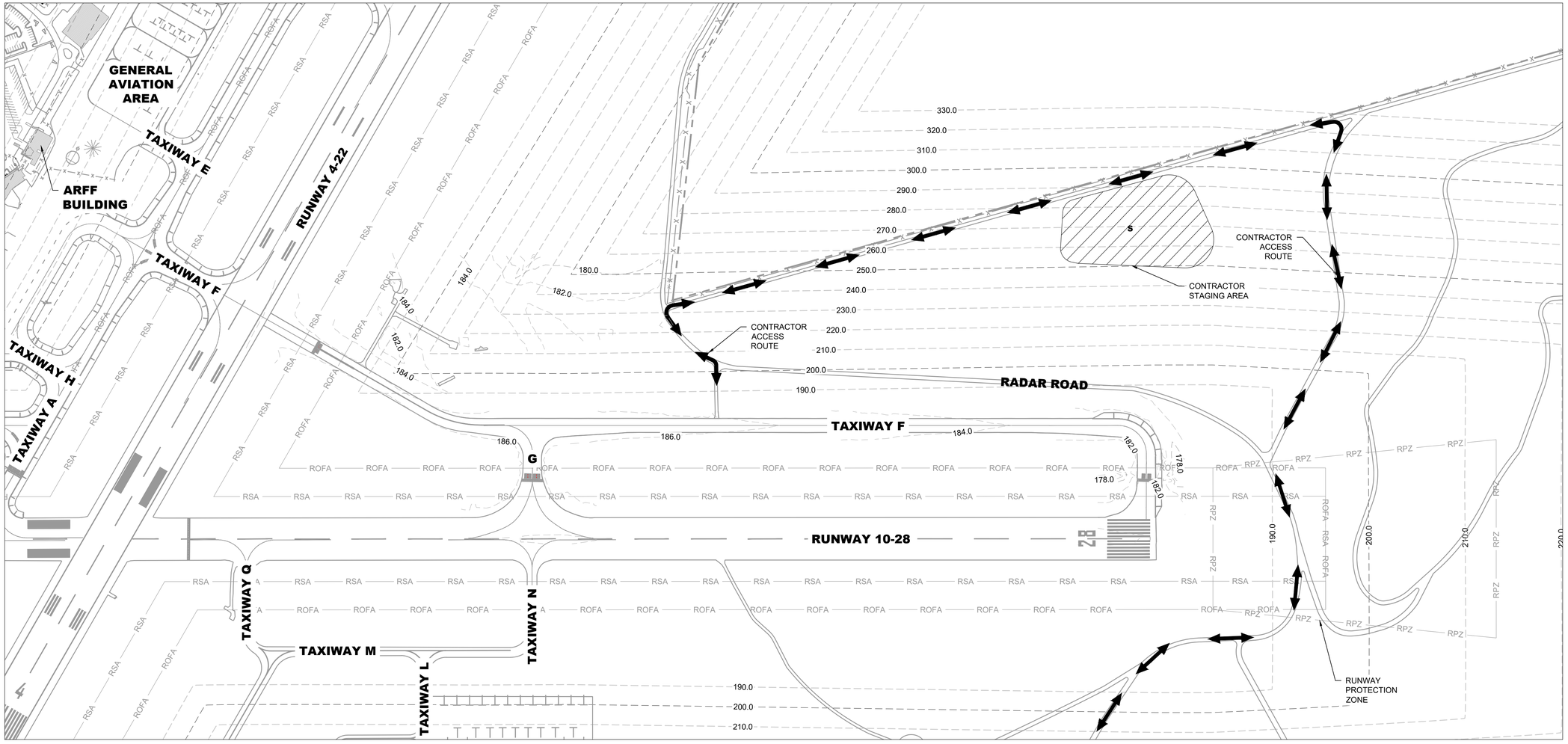

NOTES

1. THE CONTOURS SHOWN REPRESENT MSL ELEVATION LIMITS FOR CONSTRUCTION EQUIPMENT AS DEFINED BY PART 77 OF THE FAA REGULATIONS. CONSTRUCTION CRANES, VEHICLES, AND OTHER EQUIPMENT PENETRATING THESES SURFACES ARE CONSIDERED OBSTRUCTIONS TO AIR NAVIGATION. PRIOR TO SUCH EQUIPMENT USE, FAA NOTIFICATIONS, APPROVALS, AND SPECIAL OPERATING CONDITIONS MUST BE ESTABLISHED. IF ELEMENTS OF THE CONSTRUCTION PROJECT REQUIRE PART 77 SURFACE PENETRATION, A FAA FORM 7460-1 MUST BE SUBMITTED BY THE CONTRACTOR AS SOON AS POSSIBLE BEFORE CONSTRUCTION BEGINS. FAA APPROVAL CAN TAKE SEVERAL WEEKS TO OCCUR. AFTER THE FORM HAS BEEN APPROVED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND RPR A MINIMUM OF 72 HOURS IN ADVANCE WHEN ANY OF THE PART 77 WILL BE PENETRATED. THE FAA AND AIRPORT OPERATIONS HAVE THE RIGHT TO REQUIRE ANY CONSTRUCTION EQUIPMENT PENETRATING THE PART 77 SURFACES TO BE REMOVED DUE TO WEATHER OR OTHER SPECIAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
2. PART 77 AIRSPACE CONTOURS ARE BASED OFF OF PUBLISHED AIRPORT ELEVATIONS AND APPROACHES AND FAA PART 77 OBJECTS AFFECTING NAVIGABLE AIRSPACE. CONTOURS SHOWN DEPICT THE AIRSPACE CONTOURS THAT ARE ACTIVE WHILE RUNWAY 4-22 AND RUNWAY 10-28 ARE ACTIVE.

LEGEND

- S — STAGING AREA
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- RPZ — RUNWAY PROTECTION ZONE
- MAJOR PART 77 SURFACE CONTOURS (50')
- MINOR PART 77 SURFACE CONTOURS (10')
- EXISTING MAJOR CONTOUR (10')
- EXISTING MINOR CONTOUR (2')
- ACCESS ROUTE
- X — AOA FENCE
- AIRPORT PROPERTY LIMITS

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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DRAWN BY:	SVO
REVIEWED BY:	AEB

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PART 77 AIRSPACE PLAN

SHEET NUMBER

C013

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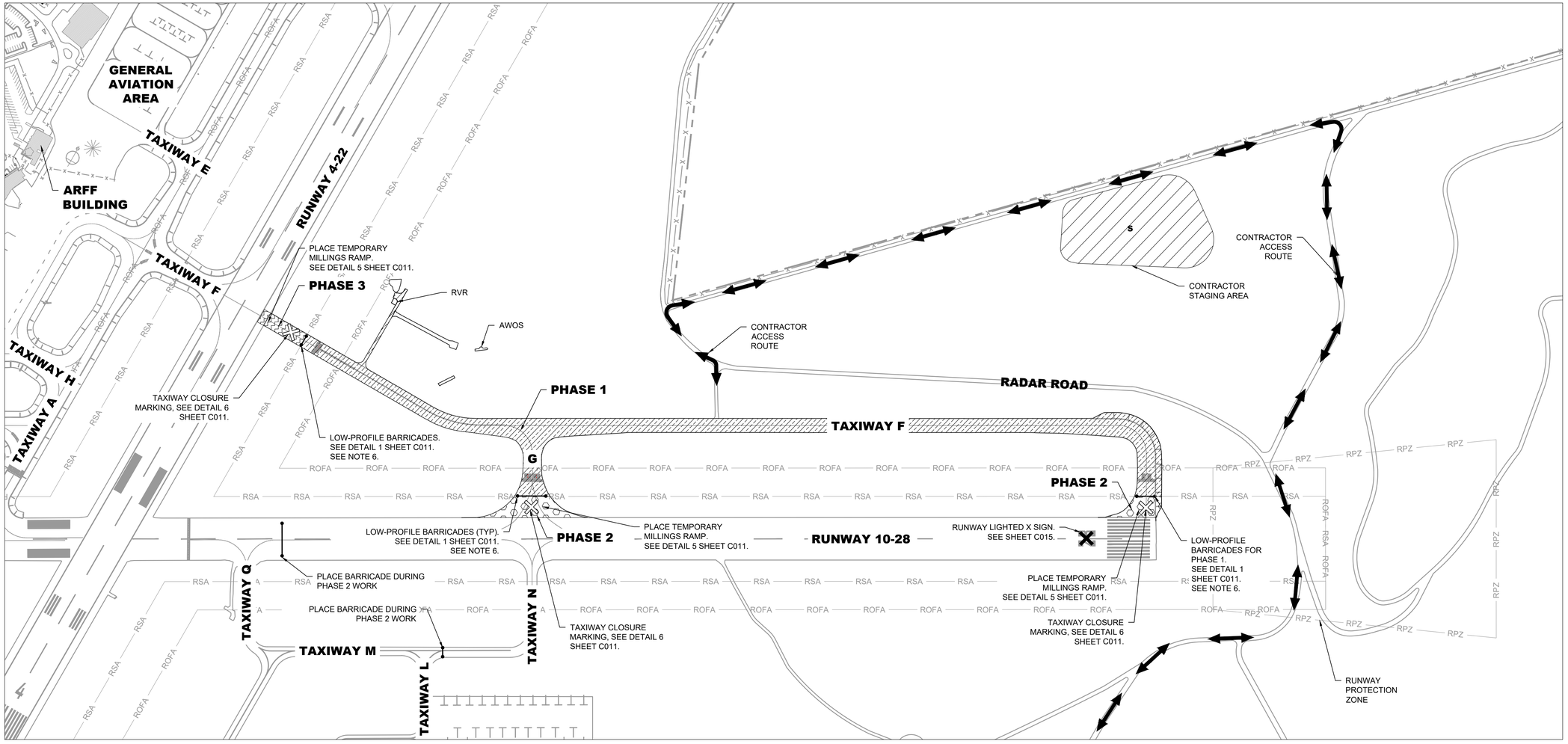
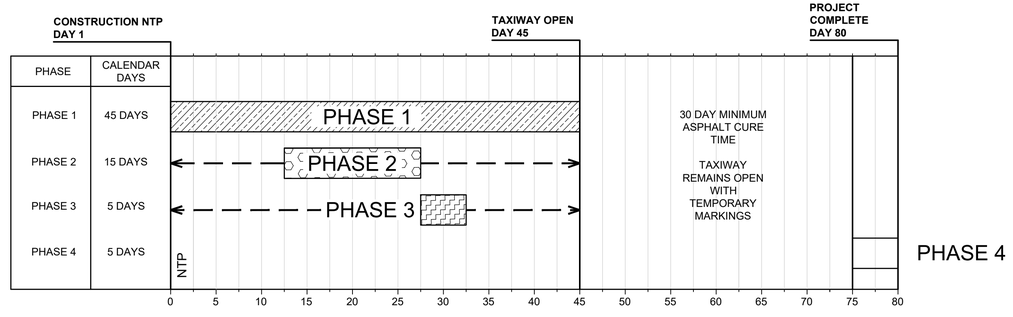


CONSTRUCTION SEQUENCING



PHASE 1 CLOSURES
- TAXIWAY F AND G
- TEMPORARY CLOSURE: RUNWAY 4-22, 12:00 AM - 5:30 AM
- TEMPORARY CLOSURE: RUNWAY 10-28

PHASE 1 WORK
- EXISTING MARKING OBLITERATION
- SHOULDER PAVEMENT REMOVAL
- SHOULDER GRADING
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 2 CLOSURES
- TAXIWAY F, G, N, AND RUNWAY 10-28
- NO TIME RESTRICTIONS

PHASE 2 WORK
- COMPLETED CONCURRENTLY WITH PHASE 1
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 3 CLOSURES
- TAXIWAY F, G, AND RUNWAY 4-22
- NIGHT TIME HOURS ONLY: 12:00 AM - 5:30 AM

PHASE 3 WORK
- COMPLETED CONCURRENTLY WITH PHASE 1, WORK SHALL NOT OCCUR CONCURRENTLY WITH PHASE 2
- MILL & OVERLAY
- AIRFIELD LIGHTING
- TEMPORARY MARKINGS

PHASE 4 CLOSURES
- TAXIWAY F, G, AND RUNWAY 10-28 NO TIME RESTRICTIONS
- RUNWAY 4-22 NIGHT TIME HOURS ONLY: 12:00 AM - 5:30 AM

PHASE 4 WORK
- PERMANENT PAVEMENT MARKING APPLICATION AND AS-BUILT PAVEMENT MARKING SURVEY

GENERAL PHASING NOTES

1. ALL PHASES MUST BE COMPLETED WITHIN CONTRACT DURATIONS.
2. EACH PHASE OF WORK SHALL BE CONTINUOUS UNLESS NOTED OTHERWISE. AN IMPACT NOTICE MUST BE SUBMITTED TO THE RPR A MINIMUM OF 7 BUSINESS DAYS PRIOR TO BEGINNING ANY NEW PHASE OF WORK.
3. REFER TO SHEET C111 FOR MILLINGS PLACEMENT LOCATION.
4. THE CONTRACTOR SHALL PLACE BOTH LIGHTED RUNWAY CLOSURE SIGNS AT BOTH ENDS OF THE RUNWAY IN ACCORDANCE WITH THE TEMPORARY RUNWAY CLOSURE PLAN ON SHEET C015.
5. CONTRACTOR MUST WAIT A MINIMUM OF 30 DAYS FOR THE ASPHALT TO CURE BEFORE APPLYING PERMANENT PAVEMENT MARKINGS, WHICH IS REFLECTED IN THE CONSTRUCTION SCHEDULE.
6. PLACE BARRICADES A MINIMUM OF 50 FEET OUTSIDE THE ASSOCIATED RSA. BARRICADE POSITIONS SHOWN ARE SCHEMATIC.
7. THE CONTRACTOR SHALL BE PROVIDED A 30-DAY ADMINISTRATIVE NTP PRIOR TO THE CONSTRUCTION NTP.

LEGEND

- PHASE 1 WORK AREA
- PHASE 2 WORK AREA
- PHASE 3 WORK AREA
- STAGING AREA (S)
- ACCESS ROUTE
- RUNWAY LIGHTED X SIGN
- TAXIWAY CLOSURE MARKING
- RPZ — RUNWAY PROTECTION ZONE
- LOW-PROFILE BARRICADES
- X — AOA FENCE
- AIRPORT PROPERTY LIMITS
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA

NORTH

200 0 200 400

SCALE (IN FEET)
1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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CONTRACTOR PHASING PLAN

SHEET NUMBER
C014

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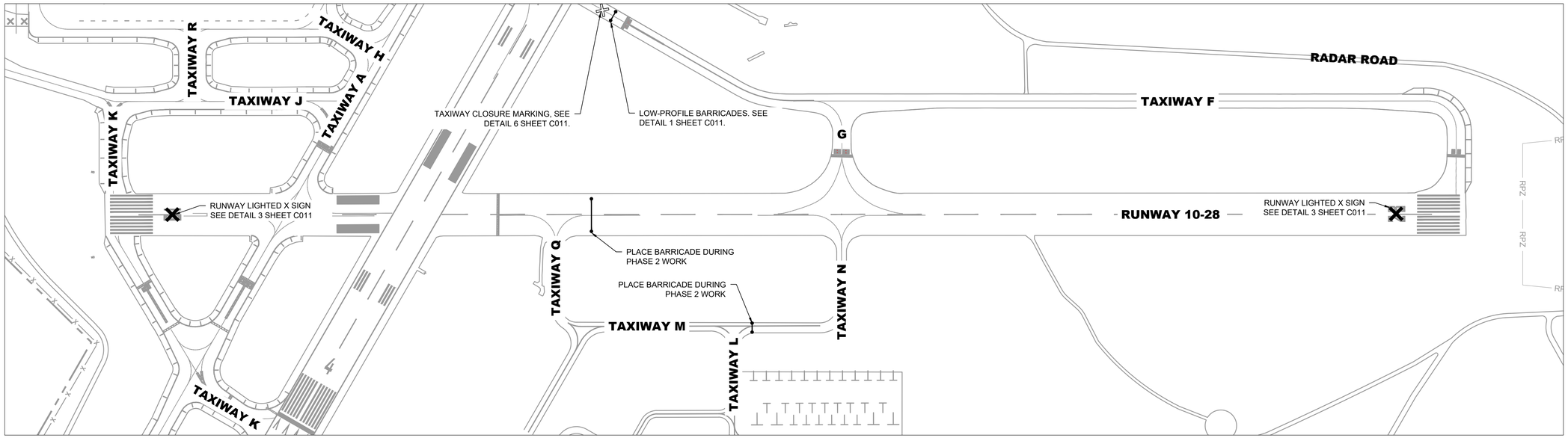


RUNWAY 10-28

TEMPORARY CLOSURE NOTES

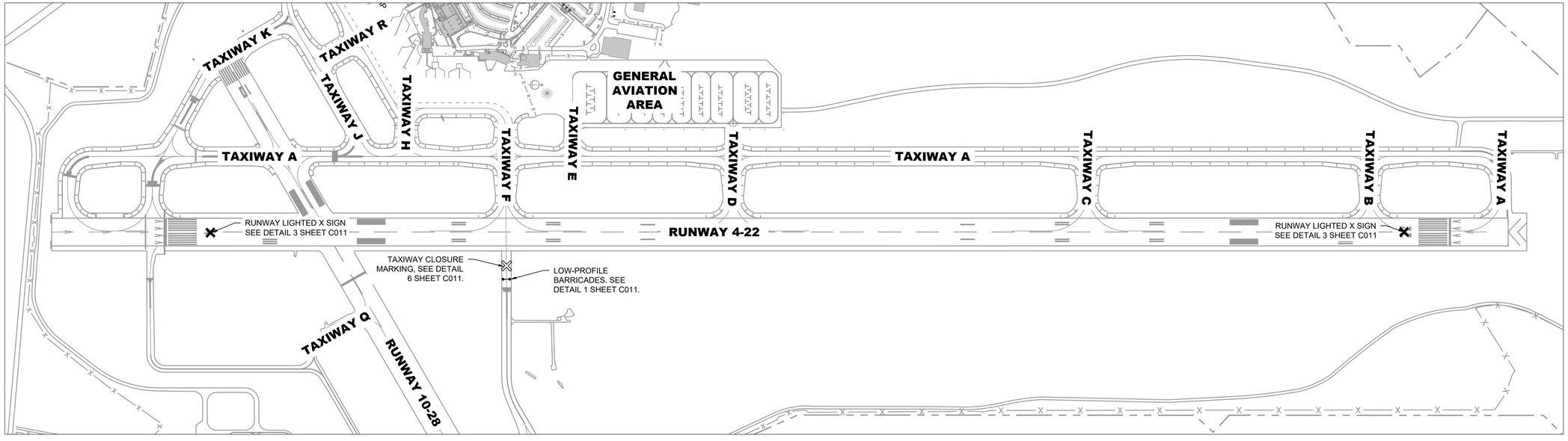
1. RUNWAY 10-28 SHALL BE CLOSED INTERMITTENTLY AND MAY NOT BE CLOSED CONCURRENTLY WITH RUNWAY 4-22 DURING PHASE 2 AND 4. REFER TO SHEET C014 FOR PHASING SCHEDULE AND ASSOCIATED WORK.

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")



RUNWAY 4-22

TEMPORARY CLOSURE NOTES

1. RUNWAY 4-22 SHALL BE CLOSED DURING PHASE 3 AND 4. REFER TO SHEET C014 FOR PHASING SCHEDULE AND ASSOCIATED WORK.
2. WORK REQUIRING CLOSURE OF RUNWAY 4-22 SHALL BE PERFORMED DURING NIGHT TIME HOURS 12:00 AM TO 5:30 AM.

NORTH

300 0 300 600

SCALE (IN FEET)

1 INCH = 300 FEET (WHEN PRINTED 34"x22")

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TEMPORARY RUNWAY CLOSURE PLAN

SHEET NUMBER

C015

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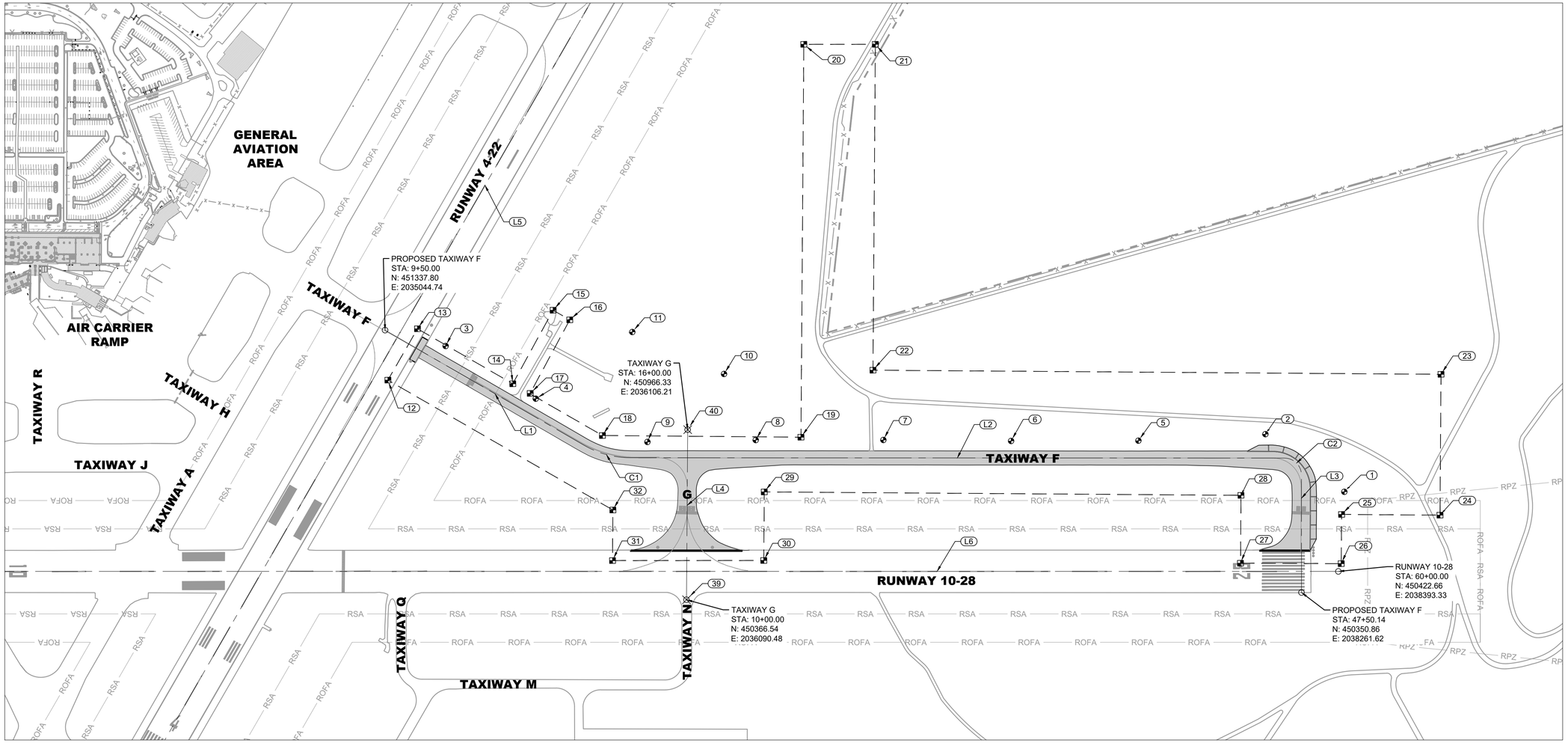

SURVEY CONTROL POINTS

POINT	NORTHING	EASTING	ELEVATION	STATION	OFFSET
1	450703.0710	2038419.7060	180.644	43+94.98	-151.3495
2	450911.5610	2038145.0920	181.108	41+74.62	-84.3047
3	451277.7220	2035257.3910	186.139	11+63.08	-58.5060
4	451085.8270	2035572.0940	185.042	15+31.68	-56.9300
5	450897.2520	2037696.3300	182.492	37+26.23	-61.2018
6	450904.7740	2037246.9440	183.712	32+76.78	-59.9134
7	450916.7660	2036796.1460	185.113	28+25.83	-63.0665
8	450925.0290	2036345.7770	185.571	23+75.39	-62.4997
9	450925.7690	2035963.2880	185.923	19+92.96	-55.7420
10	451160.3470	2036238.2700	185.095	22+63.29	-295.6651
11	451314.4180	2035917.2160	184.430	17+08.93	-431.0200

*OFFSET REFERENCED FROM TAXIWAY F, (-) AS LEFT AND (+) AS RIGHT

PROJECT AREA POINTS

POINT	NORTHING	EASTING	STATION	OFFSET
12	451161.3570	2035051.3751	10+46.89	147.6052
13	451340.4607	2035159.3057	10+46.69	-61.5051
14	451140.0830	2035491.8191	14+34.91	-61.8750
15	451396.6895	2035639.2694	14+28.48	-357.7586
16	451361.6960	2035697.3389	14+96.27	-357.8232
17	451104.9182	2035552.8162	15+05.30	-63.3065
18	450951.4811	2035804.7913	18+09.03	-59.4624
19	450932.2352	2036505.4528	25+34.89	-72.8345
20	452317.5930	2036541.9460	25+44.22	-1458.6414
21	452312.6904	2036794.4228	27+96.75	-1458.6889
22	451163.6972	2036764.1559	27+89.01	-309.3232
23	451110.8912	2038768.7855	43+01.80	-597.0807
24	450614.2891	2038755.7571	44+77.34	-489.0316
25	450623.4130	2038408.4037	44+74.84	-141.5674
26	450449.9633	2038403.8517	46+48.35	-140.3219
27	450458.2576	2038048.3447	46+46.83	215.2786
28	450697.5445	2038054.6225	40+88.37	131.4440
29	450741.7340	2036372.2861	24+05.49	120.2404
30	450499.8117	2036365.9316	24+03.88	362.2408
31	450509.8193	2035832.0549	19+02.91	365.5273
32	450688.0932	2035836.7246	18+93.44	188.0380

*OFFSET REFERENCED FROM TAXIWAY F, (-) AS LEFT AND (+) AS RIGHT

TW F LINE TABLE

LINE #	LENGTH	BEARING	START COORDINATES	END COORDINATES
L1	812.13'	S58° 52' 17.71"E	STA: 9+50.00 N: 451337.80 E: 2035044.74	STA: 17+62.13 N: 450917.96 E: 2035739.93
L2	2309.56'	S88° 52' 36.51"E	STA: 19+32.33 N: 450871.23 E: 2035901.57	STA: 42+41.89 N: 450825.95 E: 2038210.69
L3	414.04'	S01° 05' 31.30"W	STA: 43+36.11 N: 450764.82 E: 2038269.51	STA: 47+50.14 N: 450350.86 E: 2038261.62

TW G LINE TABLE

LINE #	LENGTH	BEARING	START COORDINATES	END COORDINATES
L4	600.00'	N01° 30' 10.16"E	STA: 10+00.00 N: 450366.54 E: 2036090.48	STA: 16+00.00 N: 450966.33 E: 2036106.21

RW 4-22 LINE TABLE

LINE #	LENGTH	BEARING	START COORDINATES	END COORDINATES
L5	7700.00'	N31° 06' 42.73"E	STA: 10+00.00 N: 449250.67 E: 2033843.52	STA: 87+00.00 N: 455843.10 E: 2037822.19

RW 10-28 LINE TABLE

LINE #	LENGTH	BEARING	START COORDINATES	END COORDINATES
L6	5000.00'	S88° 54' 28.70"E	STA: 10+00.00 N: 450517.95 E: 2033394.24	STA: 60+00.00 N: 450422.66 E: 2038393.33

NOTES

1. SURVEY CONTROL INFORMATION PROVIDED BY:
   MCKIM & CREED
   4300 EDWARDS MILL RD. SUITE 200
   RALEIGH, NC 27612
   TEL. (919) 233-8091
2. HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANE
   VERTICAL DATUM: NAVD88
3. ALL STATIONS AND OFFSETS FOR PROJECT AREA POINTS AND SURVEY CONTROL POINTS IN REFERENCE TO TAXIWAY F CENTERLINE.
4. CONTRACTOR SHALL FIELD VERIFY ACCURACY OF ALL CONTROL INFORMATION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES IN WRITING AT LEAST 7 DAYS PRIOR TO START OF CONSTRUCTION.
5. PAVEMENT MARKINGS ARE GIS AND SURVEY DERIVED. GIS DERIVED MARKINGS ARE INSERTED FOR REFERENCE ONLY AND SHOULD NOT BE CONSIDERED ACCURATE.

LEGEND

- P-401 ASPHALT OVERLAY
- CONTROL POINT
- PROJECT AREA POINT
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — AOA FENCE
- AIRPORT PROPERTY LIMITS
- LIMITS OF WORK

TW F CURVE TABLE

CURVE #	DELTA	CHORD LENGTH	RADIUS	CURVE LENGTH	PC STATION	PI STATION	PI COORDINATES	PT STATION
C1	030.01°	168.26	325.00	170.20	17+62.13	18+49.23	N:450872.93, E:2035814.49	19+32.33
C2	089.97°	84.83	60.00	94.22	42+41.89	43+01.86	N:450824.78, E:2038270.65	43+36.11

NORTH

200 0 200 400

SCALE (IN FEET)
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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

HORIZONTAL AND VERTICAL CONTROL PLAN

SHEET NUMBER
C020

BIDDING DOCUMENTS

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Plotted by: Odom, Stephen

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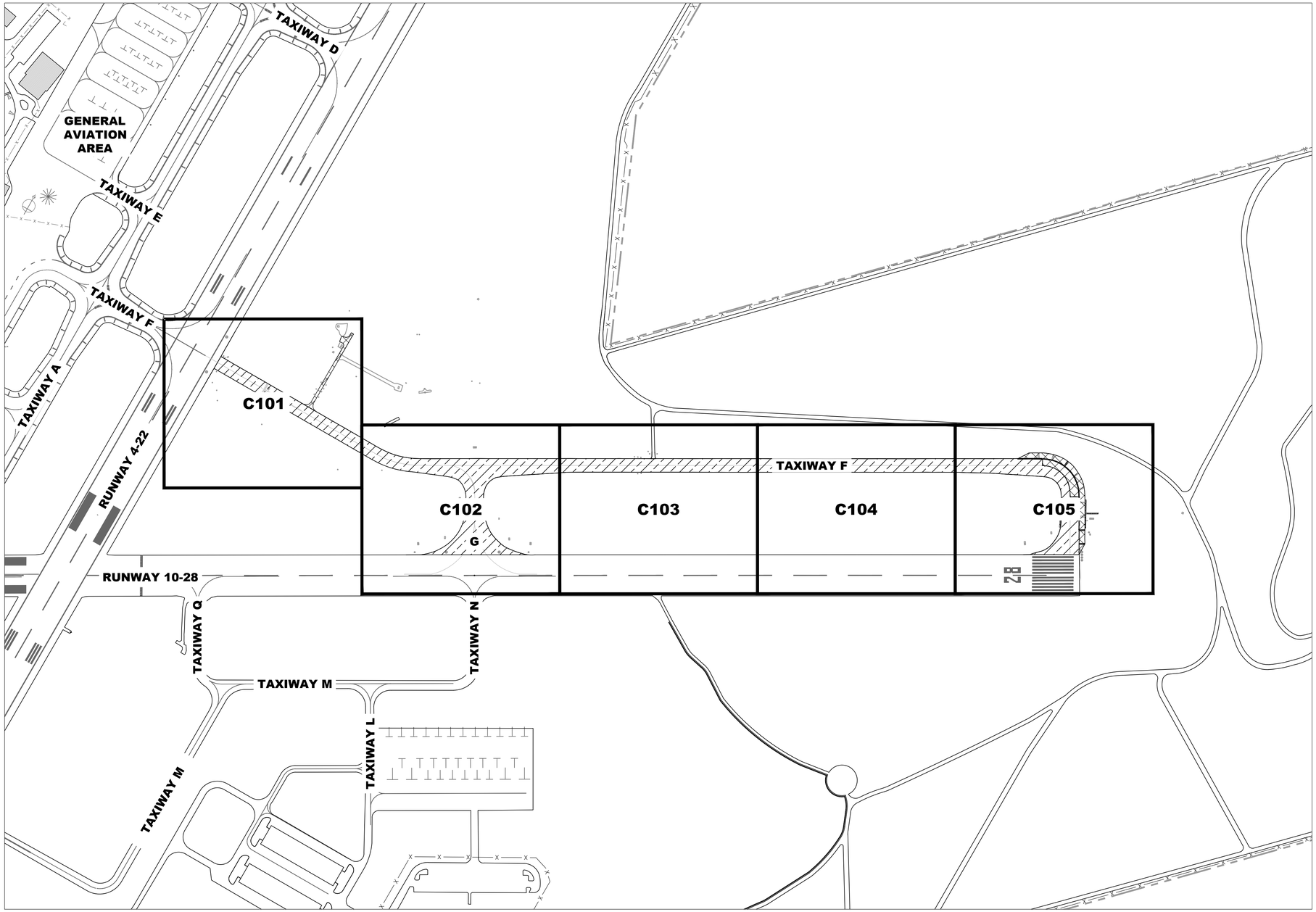

LEGEND

- EXISTING AOA FENCE
- AIRPORT PROPERTY LIMITS
- EXISTING ASPHALT MILLING
- FULL DEPTH DEMOLITION

NORTH

200 0 200 400

SCALE (IN FEET)
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SHEET TITLE

DEMOLITION KEY MAP

SHEET NUMBER

C100

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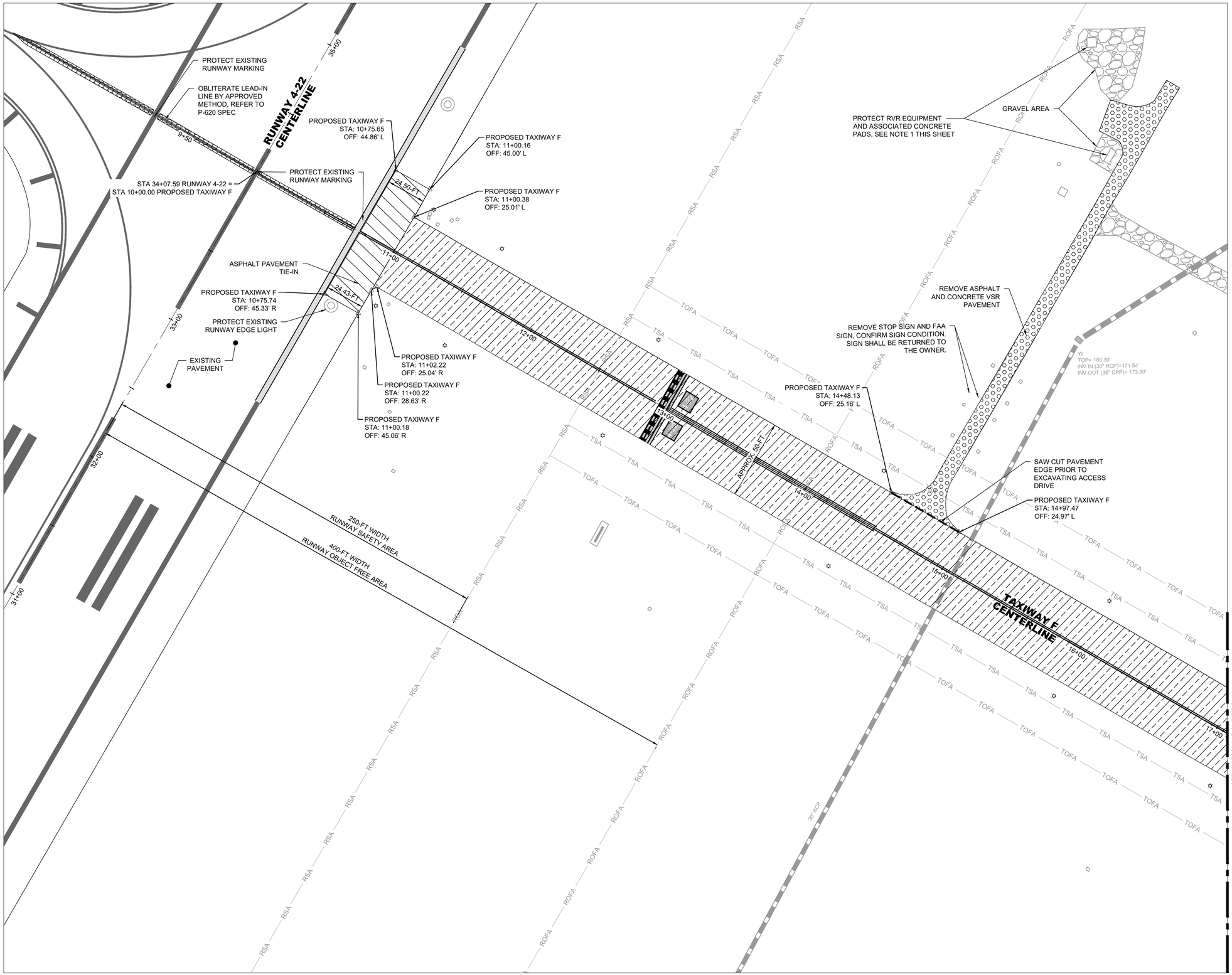

LEGEND

- RSA — EXISTING RUNWAY SAFETY AREA
- ROFA — EXISTING RUNWAY OBJECT FREE AREA
- TSA — EXISTING TAXIWAY SAFETY AREA
- TOFA — EXISTING TAXIWAY OBJECT FREE AREA
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- EXISTING INLET
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- EXISTING DUCT BANK
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- P-101-4 COLD MILLING
- P-101-6 CONC. FLUME REMOVAL
- P-620-1 MARKING OBLITERATION
- P-401-3 ASPHALT PAVEMENT KEY-IN
- SAW CUT
- GIS REFERENCED EXISTING RUNWAY MARKINGS

NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED IMMEDIATELY AT NO EXPENSE TO THE OWNER.
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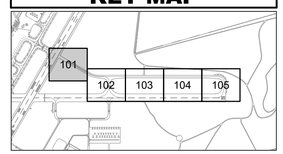
7. VSR SIGNS LABELED TO BE RETURNED TO OWNER SHALL BE INCIDENTAL TO THE TEMPORARY CONSTRUCTION PAY ITEM.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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FAYETTEVILLE, NC

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DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

DEMOLITION PLAN (1 OF 5)

SHEET NUMBER

C101

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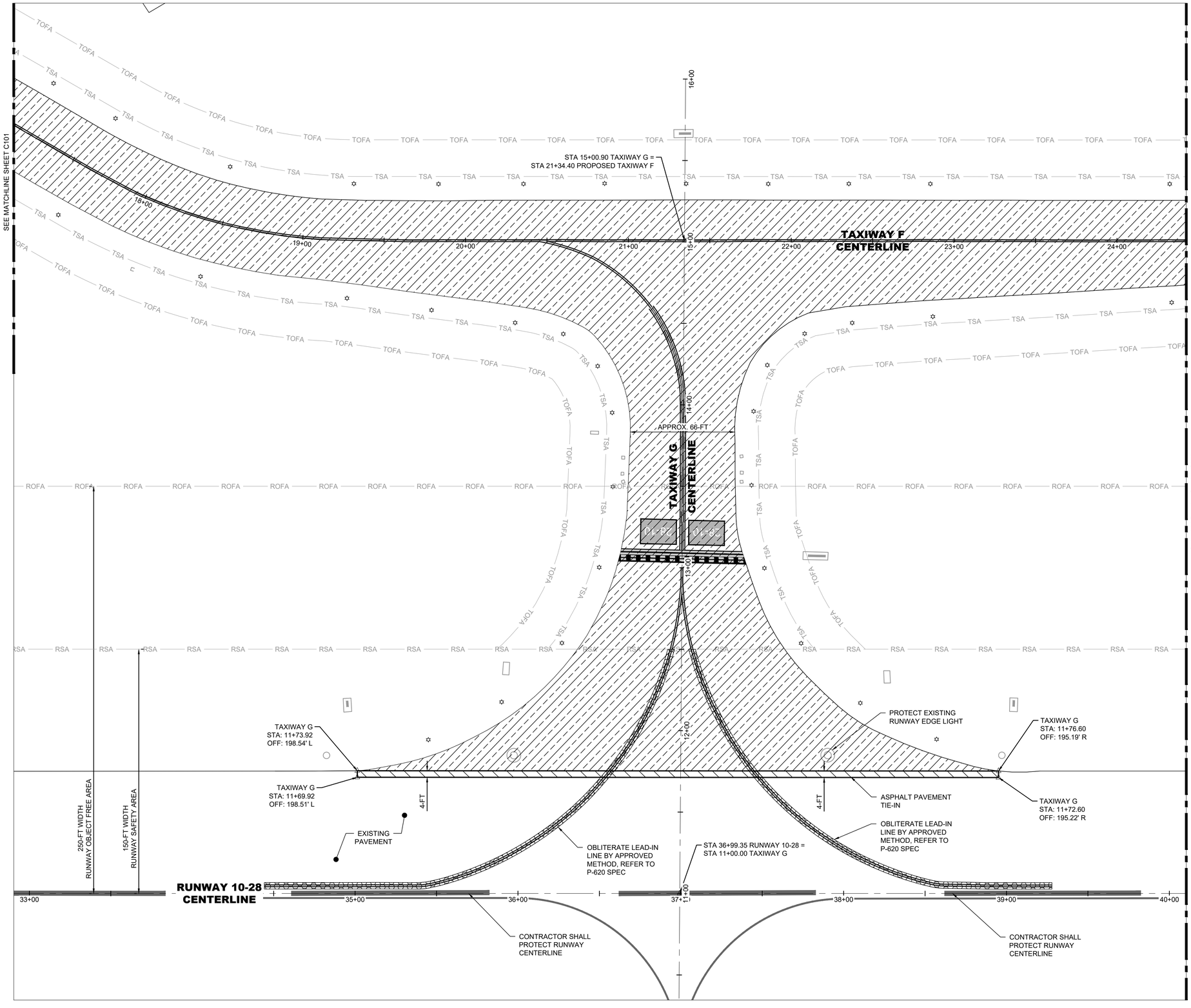

LEGEND

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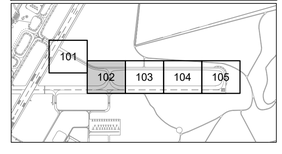
KEY MAP



NORTH

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SCALE (IN FEET)
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REVIEWED BY:	AEB

SHEET TITLE

DEMOLITION PLAN (2 OF 5)

SHEET NUMBER
C102

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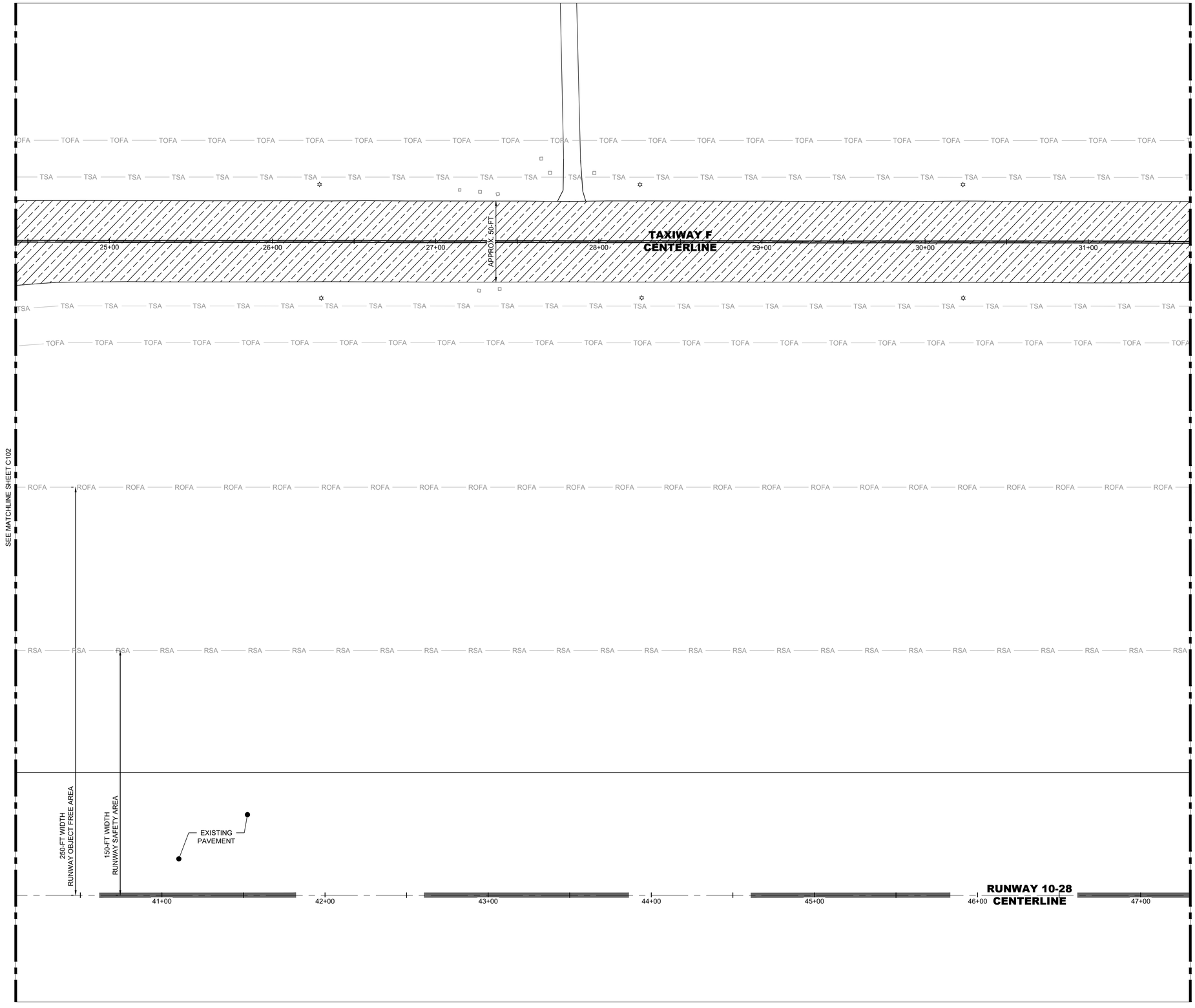

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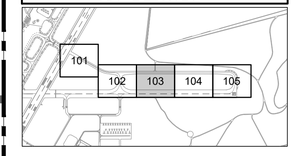

NORTH

30 0 30 60

SCALE (IN FEET)

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DRAWN BY: ERG
REVIEWED BY: AEB

SHEET TITLE

DEMOLITION PLAN (3 OF 5)

SHEET NUMBER

C103

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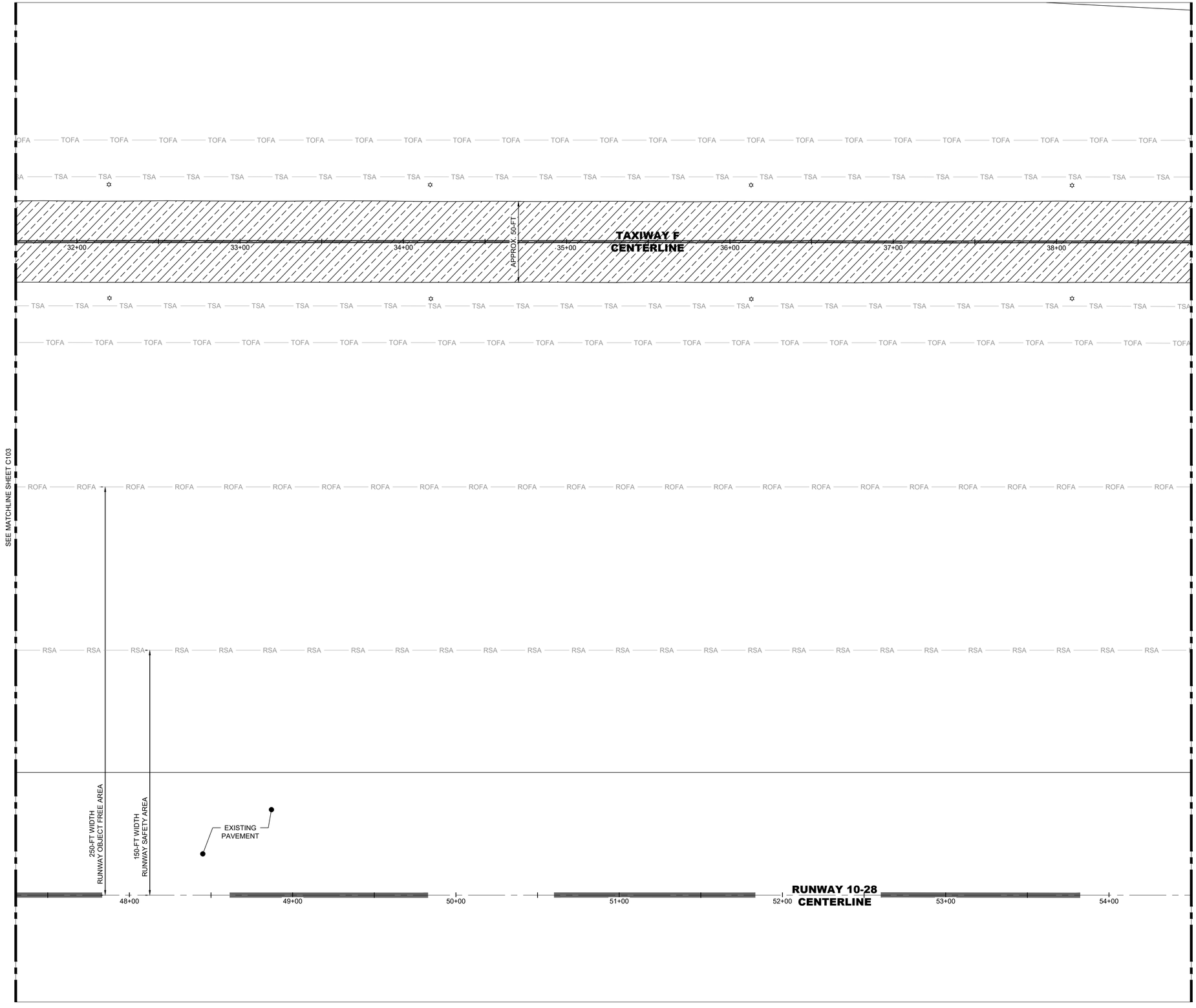

LEGEND

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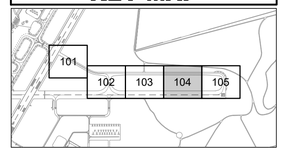

NORTH

30 0 30 60

SCALE (IN FEET)

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

DEMOLITION PLAN (4 OF 5)

SHEET NUMBER

C104

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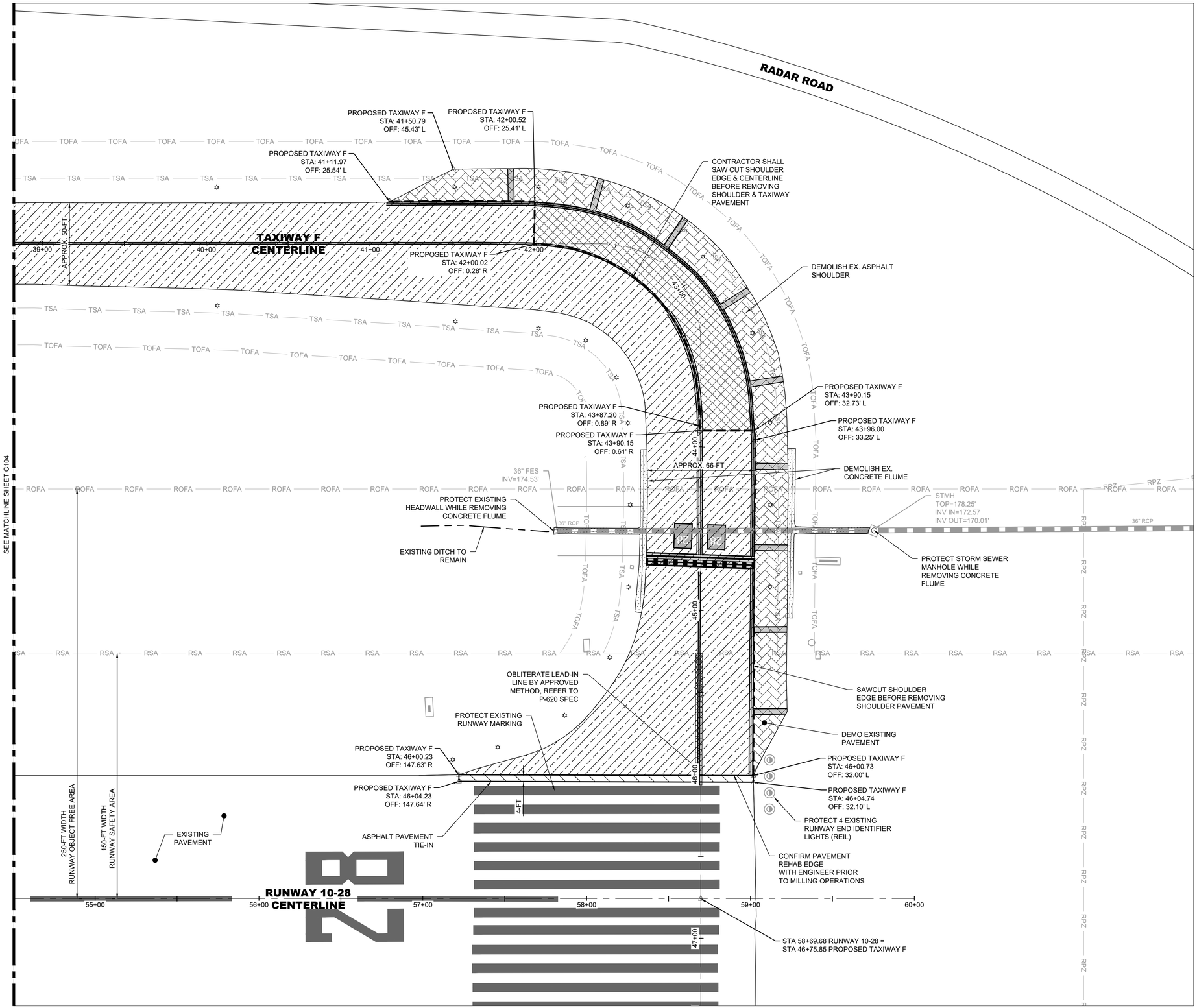


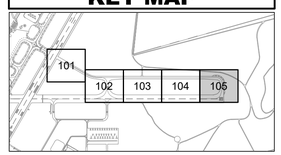
LEGEND

- RSA — EXISTING RUNWAY SAFETY AREA
- ROFA — EXISTING RUNWAY OBJECT FREE AREA
- TSA — EXISTING TAXIWAY SAFETY AREA
- TOFA — EXISTING TAXIWAY OBJECT FREE AREA
- EXISTING AOA FENCE
- EXISTING DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING RUNWAY EDGE LIGHT
- EXISTING RUNWAY END IDENTIFIER LIGHT (REIL)
- EXISTING AIRFIELD SIGN
- EXISTING GRAVEL DRIVE
- P-101-1 FULL DEPTH PAVEMENT REMOVAL
- P-101-2 FULL DEPTH PAVEMENT REMOVAL
- P-101-3 FULL DEPTH PAVEMENT REMOVAL
- P-101-4 COLD MILLING
- P-101-6 CONC. FLUME REMOVAL
- P-620-1 MARKING OBLITERATION
- P-401-3 ASPHALT PAVEMENT KEY-IN
- SAW CUT
- GIS REFERENCED EXISTING RUNWAY MARKINGS

NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED IMMEDIATELY AT NO EXPENSE TO THE OWNER.
2. SEE SHEET C231 - TYPICAL SECTIONS (1 OF 2) FOR EXISTING PAVEMENT SECTIONS.
3. SEE ELECTRICAL DEMOLITION PLANS FOR ELECTRICAL AND COMMUNICATION LINE DEMOLITION. EXISTING ELECTRICAL AND COMMUNICATION UTILITIES SHOWN FOR REFERENCE ONLY.
4. ALL PAVEMENTS TO BE REMOVED SHALL FIRST BE SAWCUT AT THE EDGES OF PAVEMENT REMOVAL. PAVEMENTS LEFT TO REMAIN SHALL HAVE A CLEAN VERTICAL FACE.
5. CONTRACTOR SHALL PROTECT EXISTING RUNWAY MARKINGS. ANY RUNWAY MARKINGS REMOVED MUST BE REMARKED AT THE CONTRACTOR'S EXPENSE ON THE DAY OF REMOVAL.
6. REFER TO HORIZONTAL AND VERTICAL CONTROLS FOR ALL ALIGNMENTS ON SHEET C020.
7. VSR SIGNS LABELED TO BE RETURNED TO OWNER SHALL BE INCIDENTAL TO THE TEMPORARY CONSTRUCTION PAY ITEM.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

1 INCH = 30 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\C\C100.dwg

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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

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SHEET TITLE

DEMOLITION PLAN (5 OF 5)

SHEET NUMBER

C105

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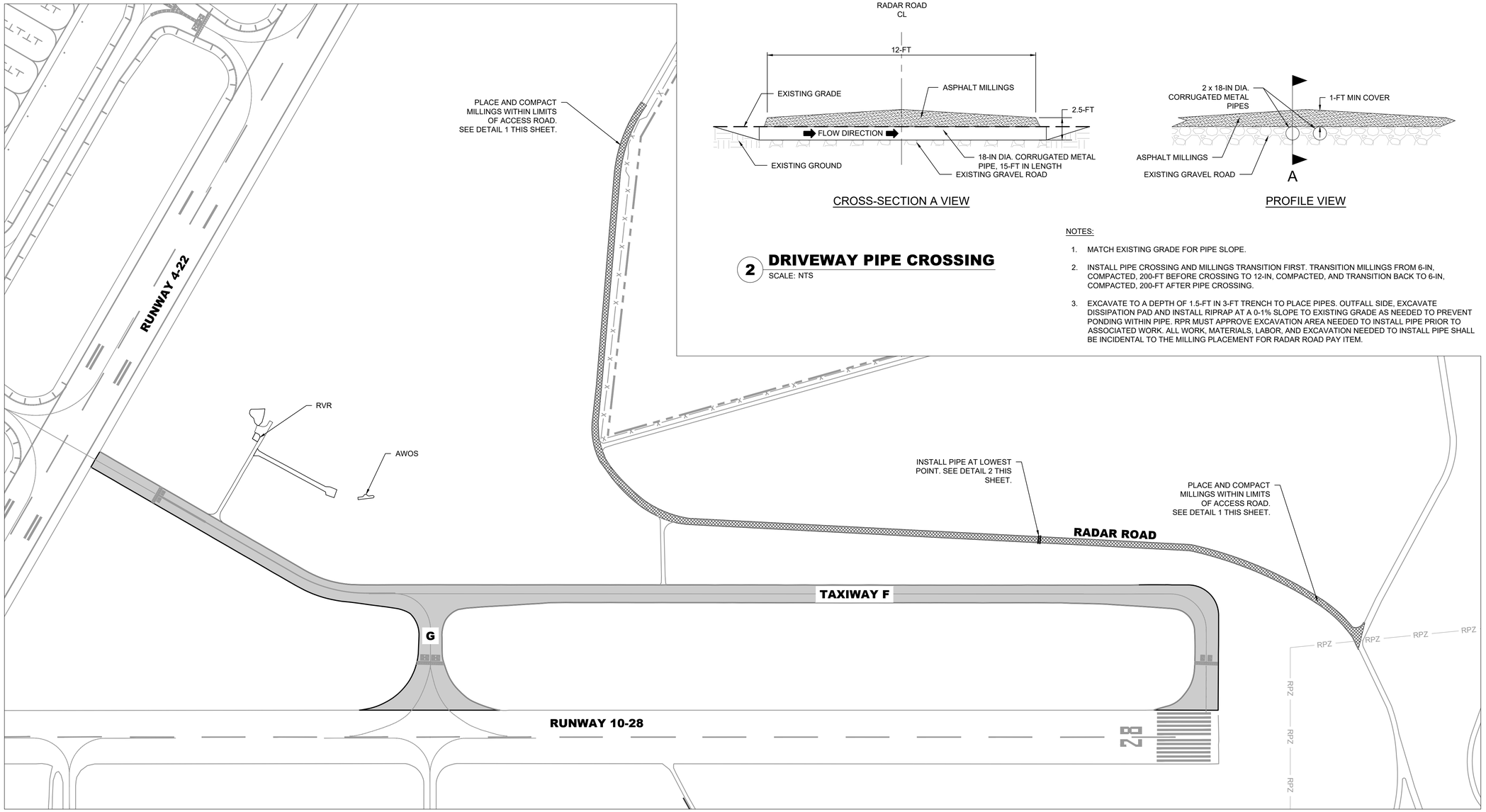


CROSS-SECTION A VIEW

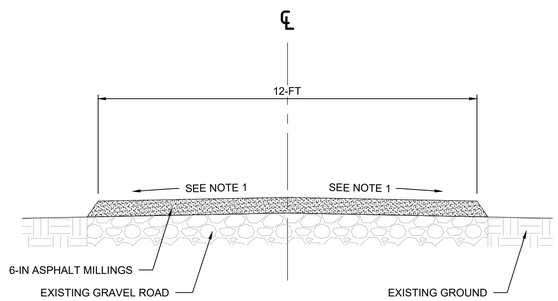
PROFILE VIEW

2 DRIVEWAY PIPE CROSSING

SCALE: NTS

NOTES:

1. MATCH EXISTING GRADE FOR PIPE SLOPE.
2. INSTALL PIPE CROSSING AND MILLINGS TRANSITION FIRST. TRANSITION MILLINGS FROM 6-IN, COMPACTED, 200-FT BEFORE CROSSING TO 12-IN, COMPACTED, AND TRANSITION BACK TO 6-IN, COMPACTED, 200-FT AFTER PIPE CROSSING.
3. EXCAVATE TO A DEPTH OF 1.5-FT IN 3-FT TRENCH TO PLACE PIPES. OUTFALL SIDE, EXCAVATE DISSIPATION PAD AND INSTALL RIPRAP AT A 0-1% SLOPE TO EXISTING GRADE AS NEEDED TO PREVENT PONDING WITHIN PIPE. RPR MUST APPROVE EXCAVATION AREA NEEDED TO INSTALL PIPE PRIOR TO ASSOCIATED WORK. ALL WORK, MATERIALS, LABOR, AND EXCAVATION NEEDED TO INSTALL PIPE SHALL BE INCIDENTAL TO THE MILLING PLACEMENT FOR RADAR ROAD PAY ITEM.



1 MILLINGS PLACEMENT TYPICAL SECTION

SCALE: NTS

NOTES

1. CONTRACTOR SHALL MATCH EXISTING GRADE WHEN PLACING ASPHALT MILLINGS. CONTRACTOR SHALL PERFORM LIGHT GRADING TO ENSURE NO DAMMING OF WATER ALONG HAUL ROUTE AS DETERMINED BY THE RPR.
2. CONTRACTOR SHALL COMPACT MILLINGS IN TWO, 3 INCH LIFTS AS NECESSARY TO REACH 6 INCHES AFTER COMPACTION.
3. ALL MILLINGS BECOME PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ALL MILLINGS AT A DESIGNATED LOCATION BASED ON THIS PLAN IMMEDIATELY AFTER MILLING OPERATIONS.
4. THE CONTRACTOR IS NOT AUTHORIZED TO STORE STOCKPILES OF MILLINGS AND SHALL BE FINANCIALLY RESPONSIBLE FOR MOVING STOCKPILES AS A RESULT OF THIS STATEMENT.
5. IF MILLING PRODUCTION EXCEEDS THE DEFINED AREA SHOWN ABOVE, THE CONTRACTOR SHALL PLACE EXCESS MILLINGS ALONG THE VEHICLE SERVICE ROAD UNTIL EXHAUSTION OF MILLINGS HAS OCCURRED.

LEGEND

- ASPHALT OVERLAY
- MILLINGS PLACEMENT AREA
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ACCESS ROUTE
- X AOA FENCE
- AIRPORT PROPERTY LIMITS

NORTH

150 0 150 300

SCALE (IN FEET)

1 INCH = 150 FEET (WHEN PRINTED 34"x22")

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SHEET TITLE

MILLINGS PLACEMENT PLAN

SHEET NUMBER

C111

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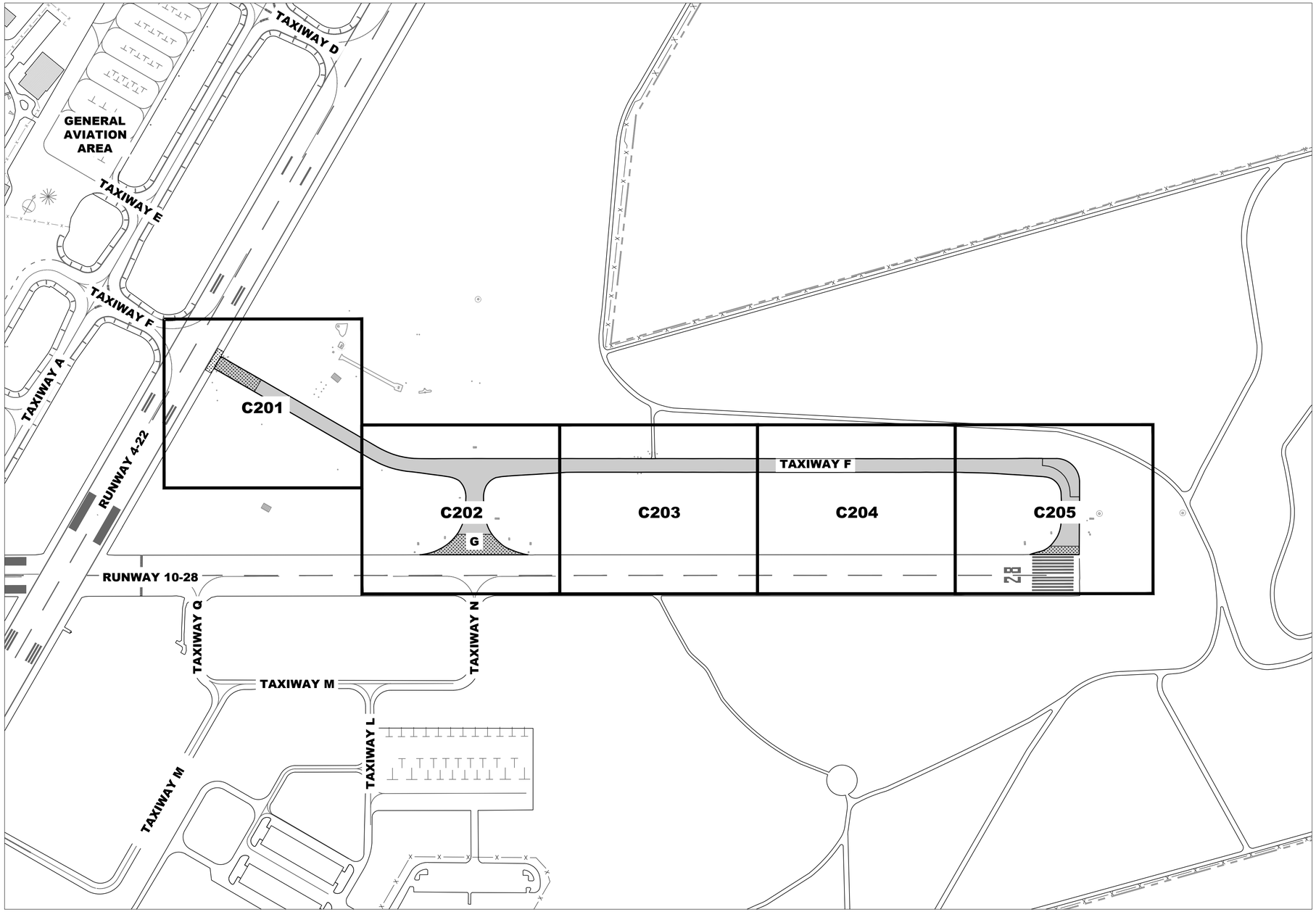

LEGEND

- EXISTING AOA FENCE
- AIRPORT PROPERTY LIMITS
- P-401 ASPHALT OVERLAY

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\C\C200.dwg

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SHEET TITLE

PAVING KEY MAP

SHEET NUMBER

C200

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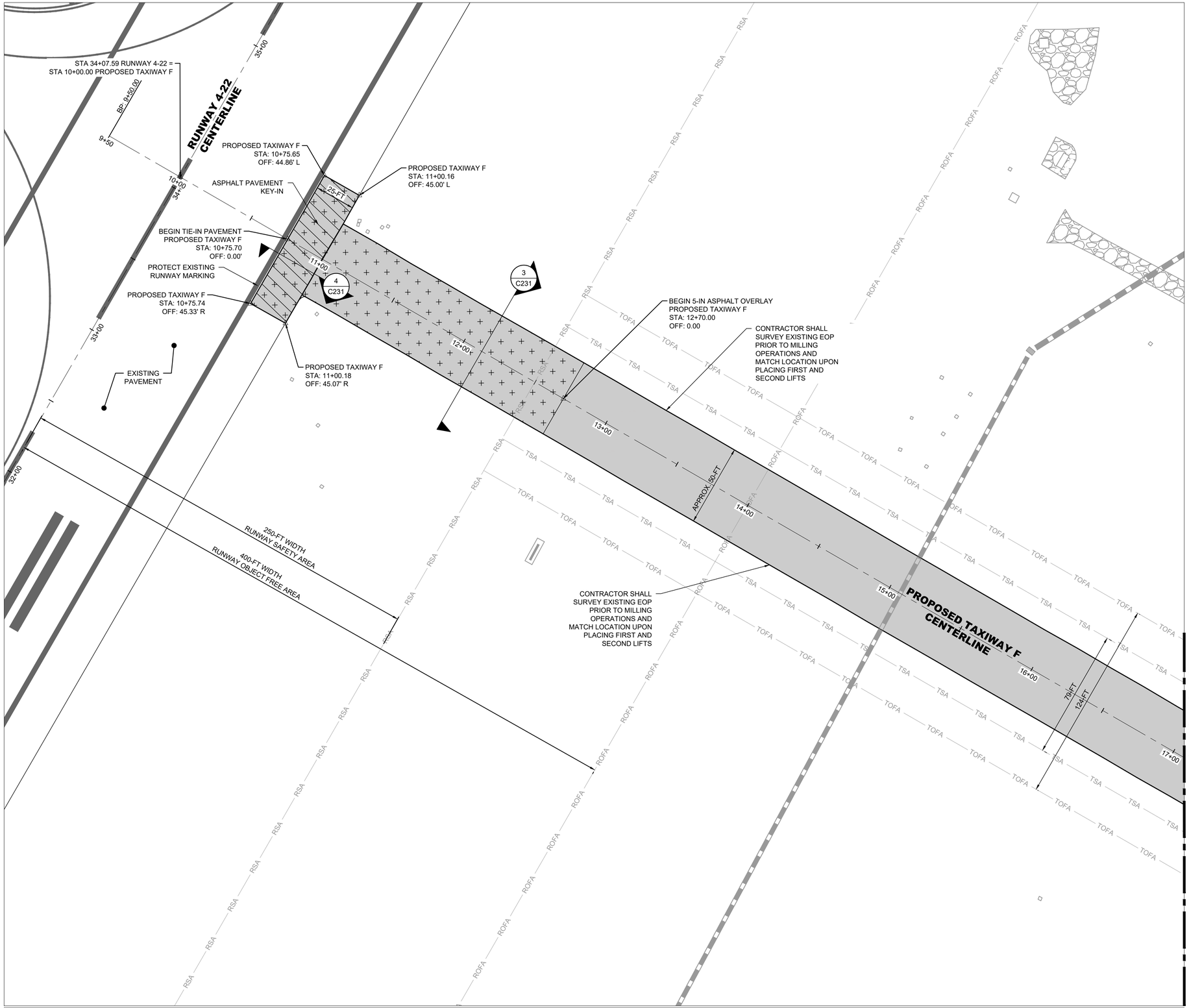

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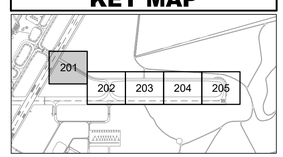
LEGEND

- P-401 ASPHALT OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ASPHALT PAVEMENT KEY-IN
- ASPHALT PAVEMENT TIE-IN SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- AOA FENCE
- DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING AIRFIELD SIGN
- EXISTING GRAVEL DRIVE
- DETAIL / SHEET — TYPICAL SECTION CALLOUT

NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER.
2. FOR PROPOSED MILLINGS LOCATIONS, REFER TO SHEET C111 - MILLINGS PLACEMENT PLAN.
3. SEE SHEET C231 TO C232 FOR TYPICAL PAVEMENT SECTIONS.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

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SHEET TITLE

PAVING PLAN (1 OF 5)

SHEET NUMBER

C201

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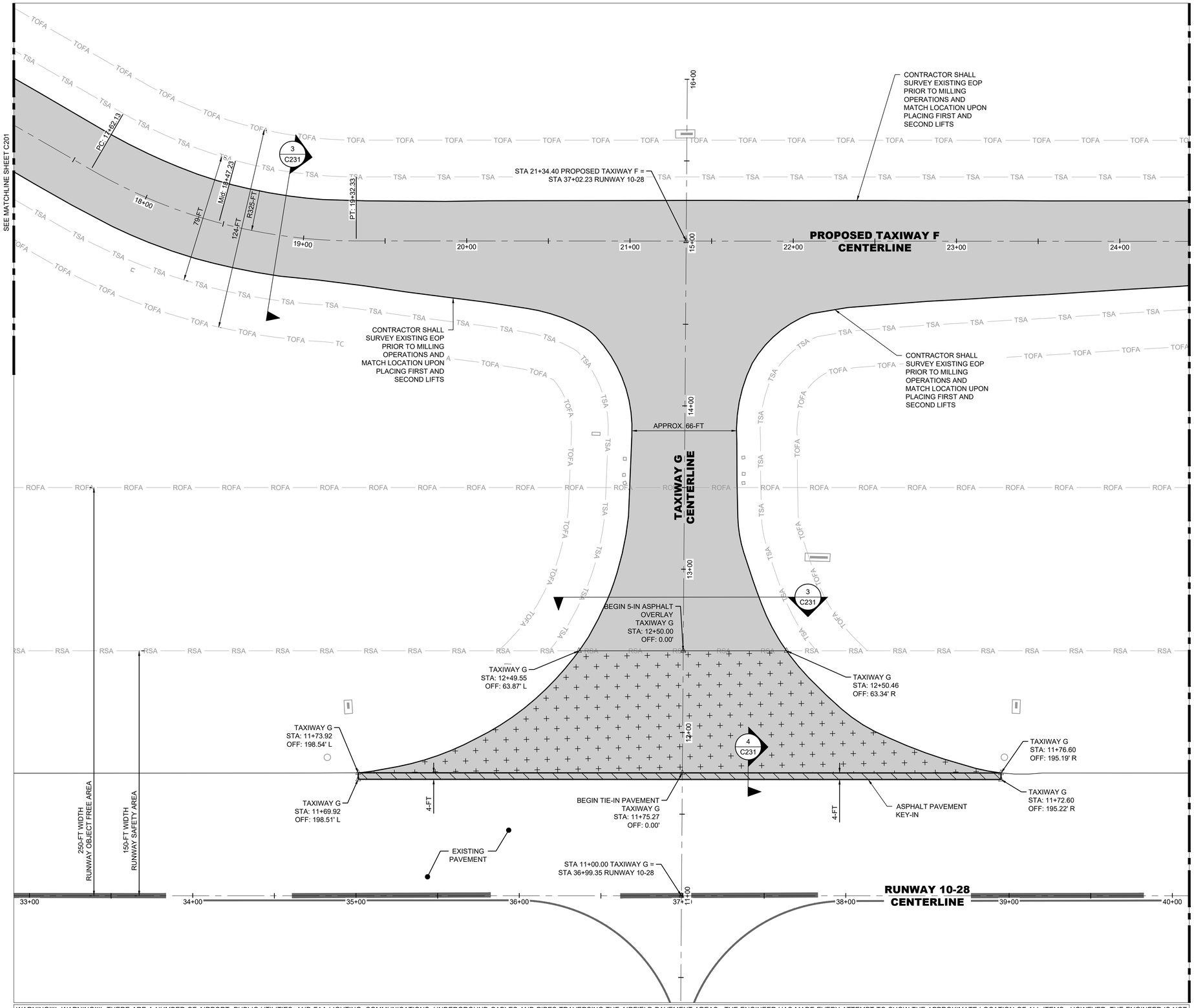

LEGEND

- P-401 ASPHALT OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ASPHALT PAVEMENT KEY-IN
- ASPHALT PAVEMENT TIE-IN SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- x — AOA FENCE
- DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING AIRFIELD SIGN
- EXISTING GRAVEL DRIVE
- DETAIL / SHEET — TYPICAL SECTION CALLOUT

NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER.
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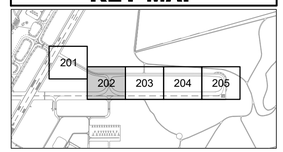
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)
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SHEET TITLE

PAVING PLAN (2 OF 5)

SHEET NUMBER
C202

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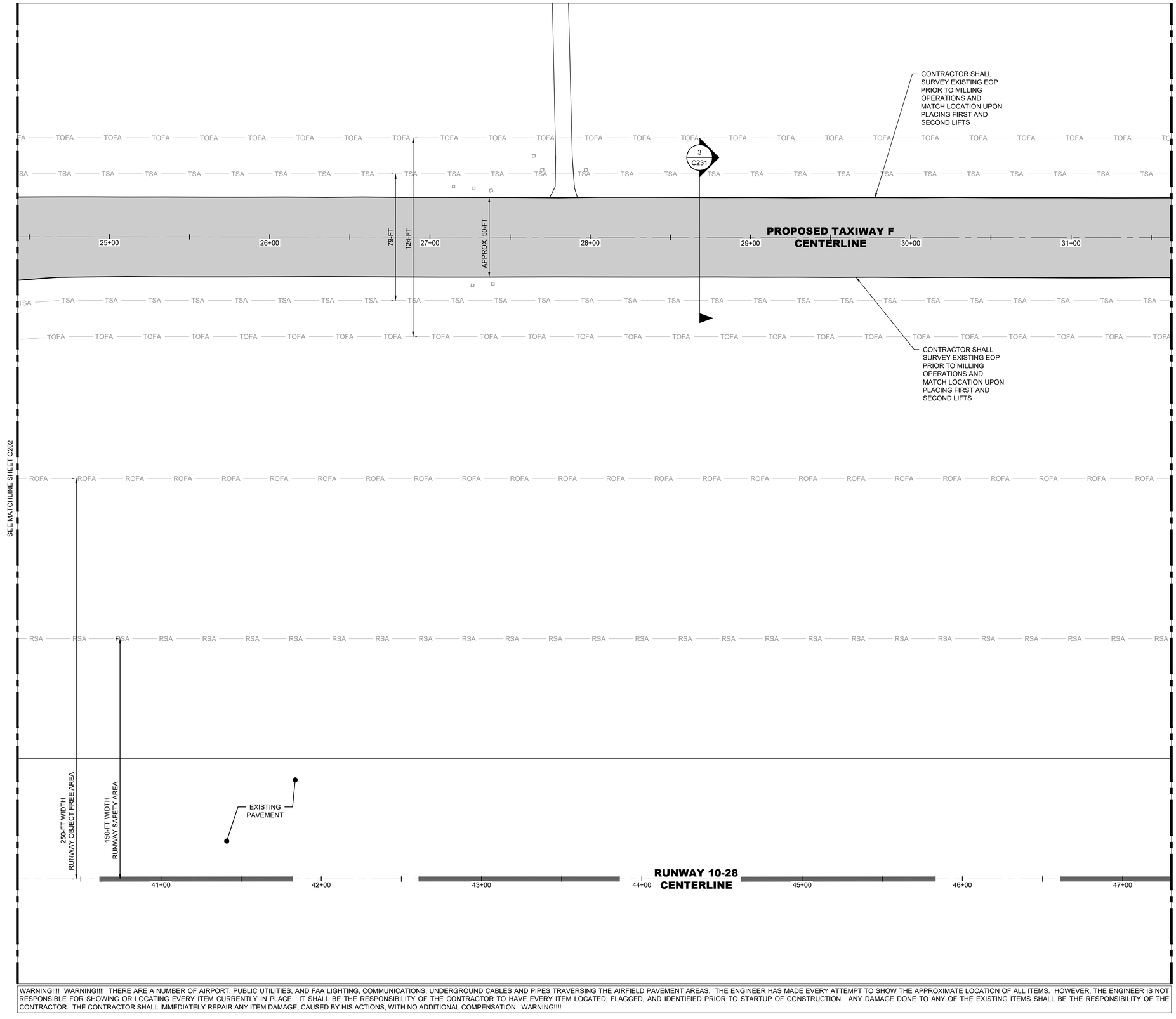

LEGEND

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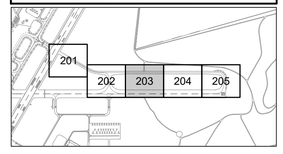

NORTH

30 0 30 60

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PAVING PLAN (3 OF 5)

SHEET NUMBER

C203

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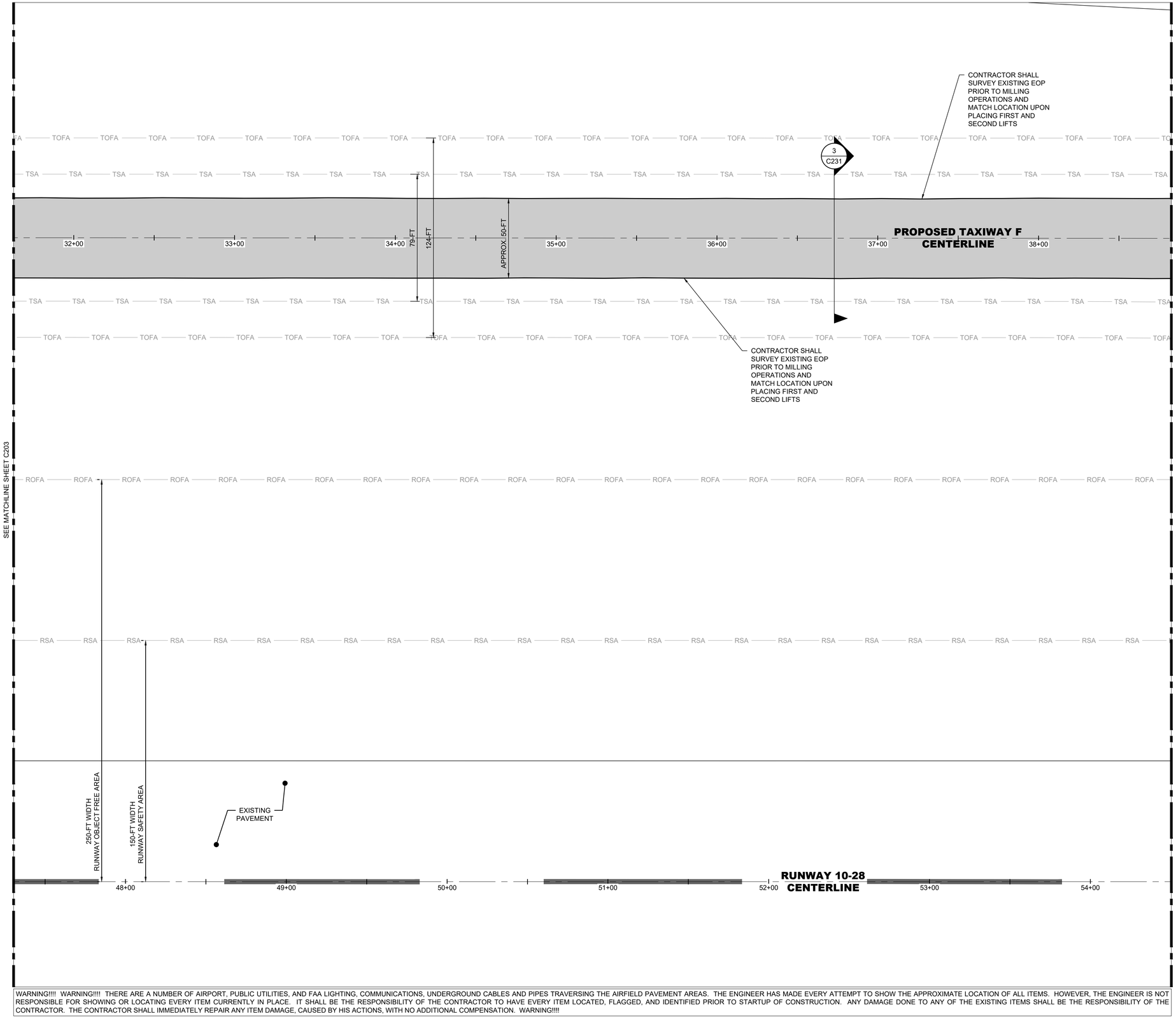

LEGEND

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- ASPHALT PAVEMENT TIE-IN SECTION
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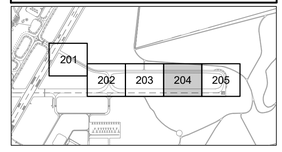

NORTH

SCALE (IN FEET)
30 0 30 60
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WARNING!!!! WARNING!!!! THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES, AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUND CABLES AND PIPES TRAVERSING THE AIRFIELD PAVEMENT AREAS. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO STARTUP OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY ITEM DAMAGE, CAUSED BY HIS ACTIONS, WITH NO ADDITIONAL COMPENSATION. WARNING!!!!

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

PAVING PLAN (4 OF 5)

SHEET NUMBER

C204

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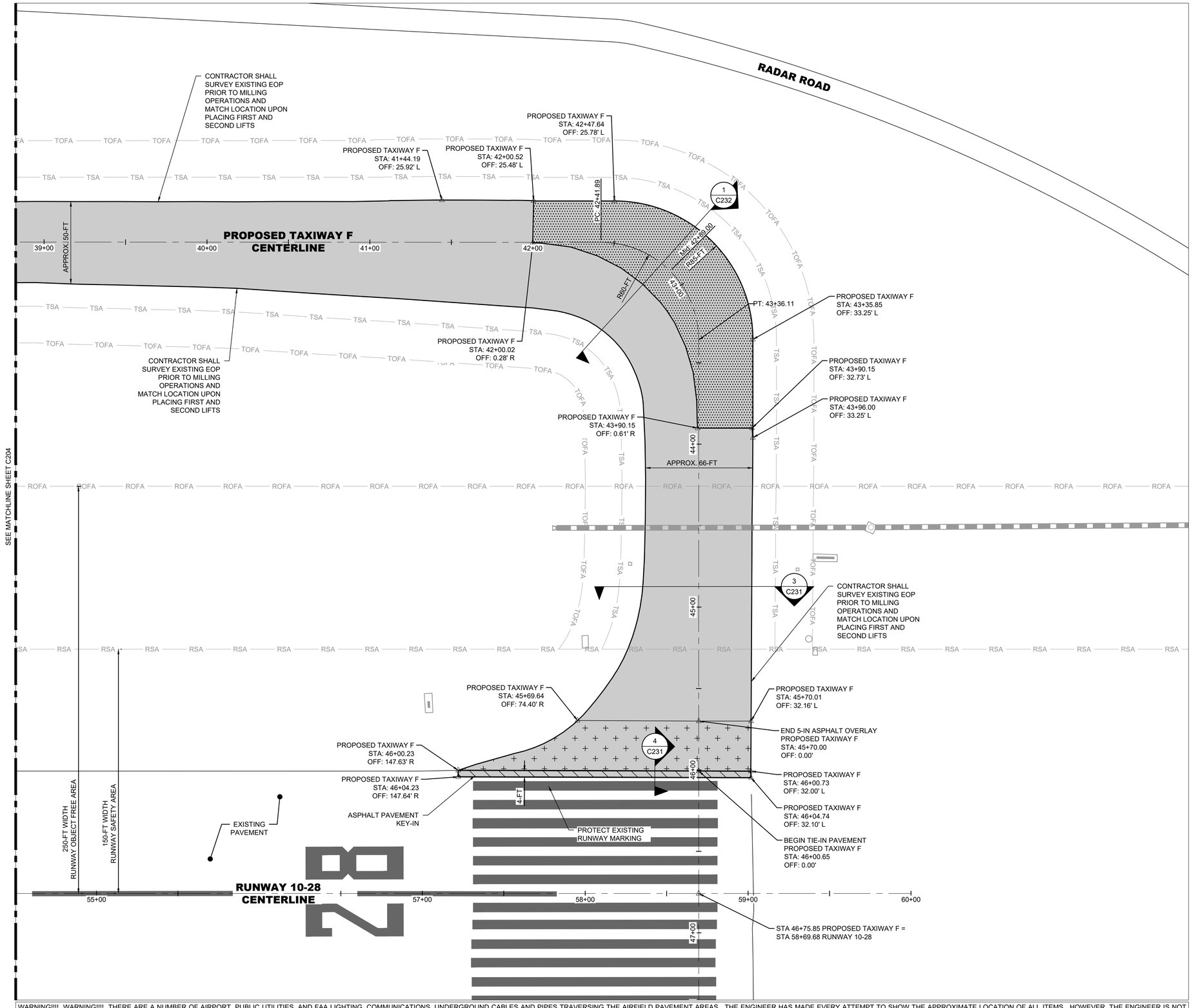
Plotted by: Odom, Stephen



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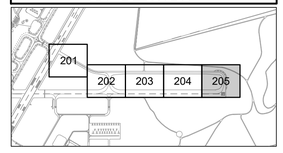
LEGEND

- P-401 ASPHALT OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ASPHALT PAVEMENT KEY-IN
- ASPHALT PAVEMENT TIE-IN SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- AOA FENCE
- DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING AIRFIELD SIGN
- EXISTING GRAVEL DRIVE
- DETAIL / SHEET — TYPICAL SECTION CALLOUT

NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, DRAINAGE, FAA CABLES, AIRFIELD LIGHTING, NAVAIDS, AND EXISTING INFRASTRUCTURE TO REMAIN. ANY DAMAGE TO EXISTING INFRASTRUCTURE SHALL BE REPAIRED AT NO EXPENSE TO THE OWNER.
2. FOR PROPOSED MILLINGS LOCATIONS, REFER TO SHEET C111 - MILLINGS PLACEMENT PLAN.
3. SEE SHEET C231 TO C232 FOR TYPICAL PAVEMENT SECTIONS.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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REVIEWED BY:	AEB

SHEET TITLE

PAVING PLAN (5 OF 5)

SHEET NUMBER

C205

BIDDING DOCUMENTS

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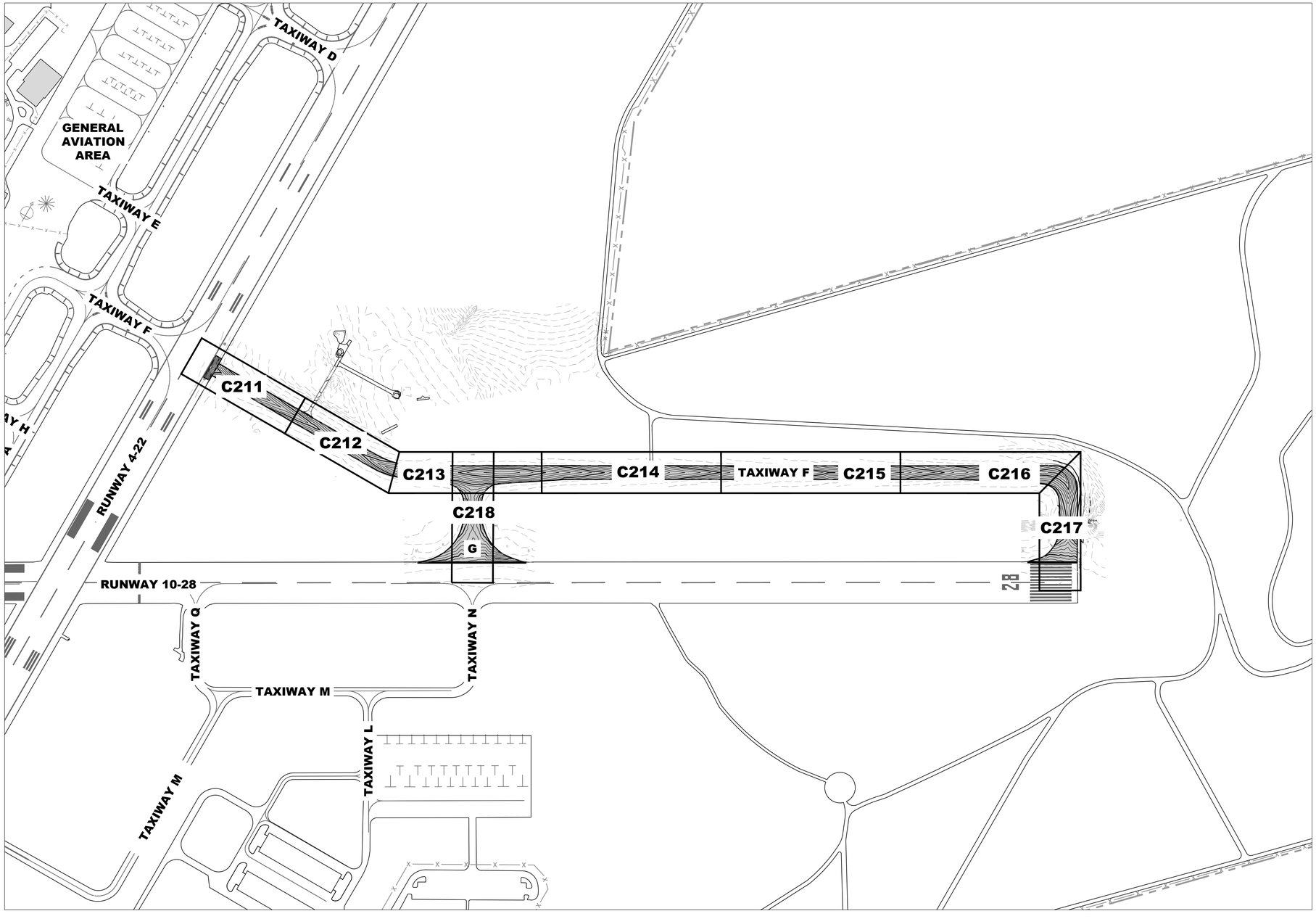

LEGEND

- P-401 ASPHALT OVERLAY
- AIRPORT PROPERTY LIMITS
- AOA FENCE

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F & G PLAN AND PROFILE KEY MAP

SHEET NUMBER

C210

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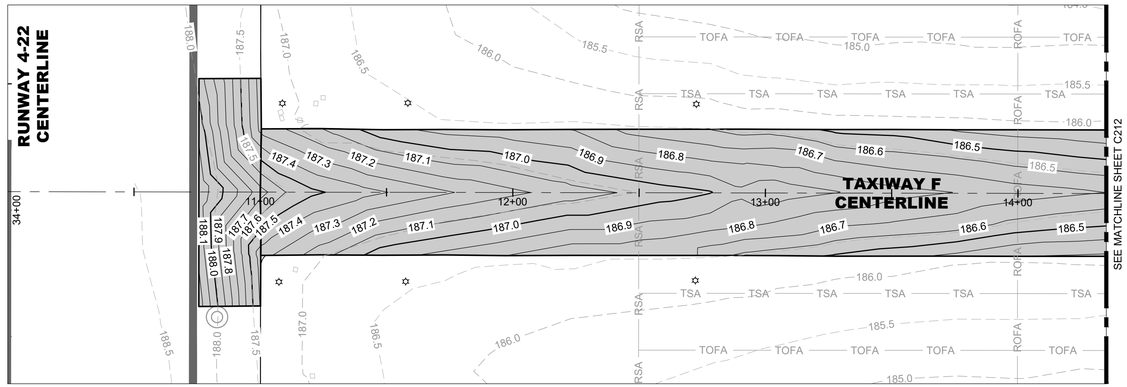
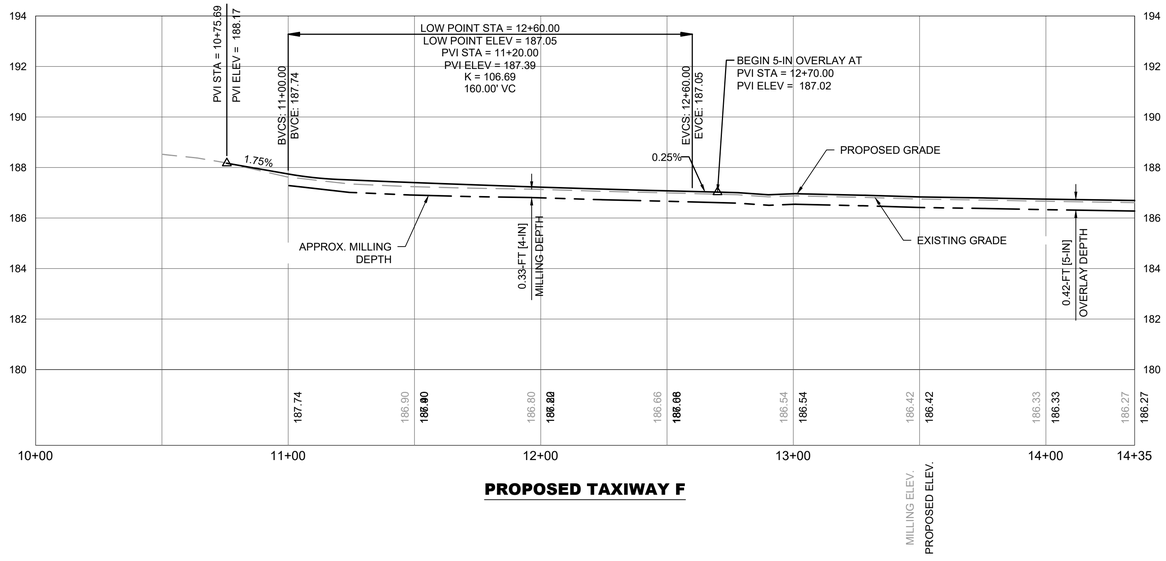




PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
- APPROXIMATE MILLINGS DEPTH
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

1. REFER TO SHEET C231 FOR TYPICAL SECTIONS.
2. REFER TO SHEETS C320 - C325 FOR THE FINAL ELEVATION PLANS.
3. CONTRACTOR IS RESPONSIBLE FOR MATCHING EXISTING GRADE IN THE 5 INCH OVERLAY AREA AS SPECIFIED. SUBMIT SURVEY OF FINAL GRADES TO RPR FOR REVIEW AND ACCEPTANCE.
4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

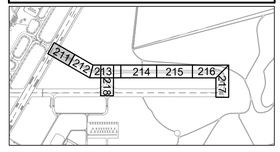
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (1 OF 7)

SHEET NUMBER

C211

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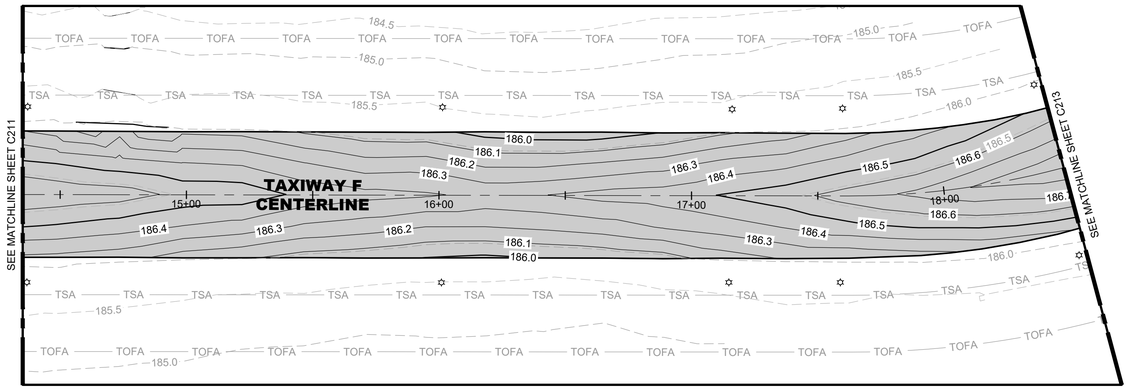
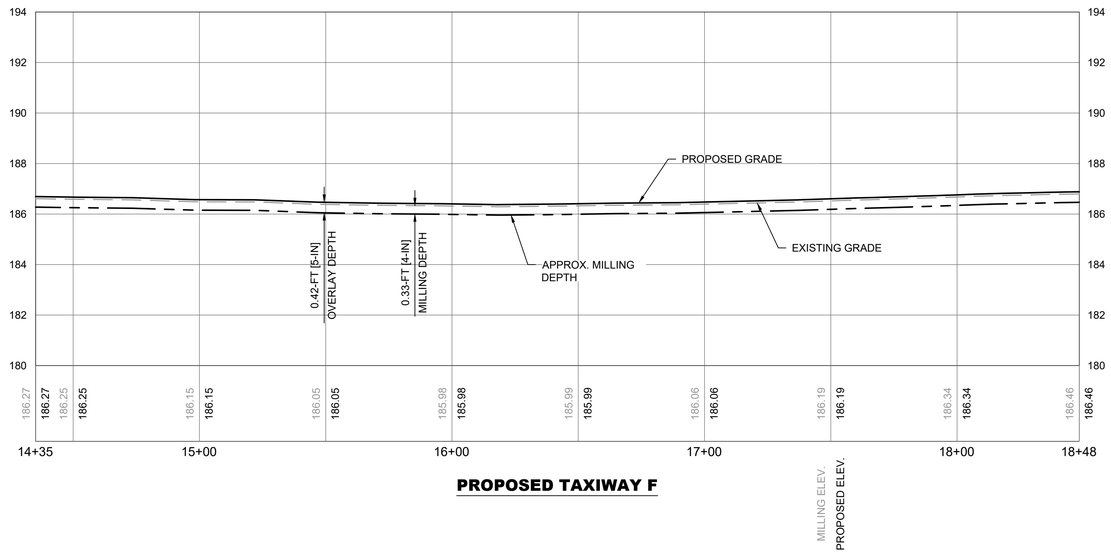
Plotted by: Odom, Stephen





PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
- APPROXIMATE MILLINGS DEPTH
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

1. REFER TO SHEET C231 FOR TYPICAL SECTIONS.
2. REFER TO SHEETS C320 - C325 FOR THE FINAL ELEVATION PLANS.
3. CONTRACTOR IS RESPONSIBLE FOR MATCHING EXISTING GRADE IN THE 5 INCH OVERLAY AREA AS SPECIFIED. SUBMIT SURVEY OF FINAL GRADES TO RPR FOR REVIEW AND ACCEPTANCE.
4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

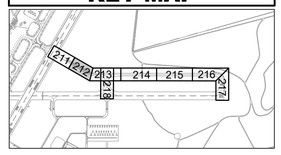
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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FAYETTEVILLE REGIONAL AIRPORT

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FAYETTEVILLE, NC

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (2 OF 7)

SHEET NUMBER

C212

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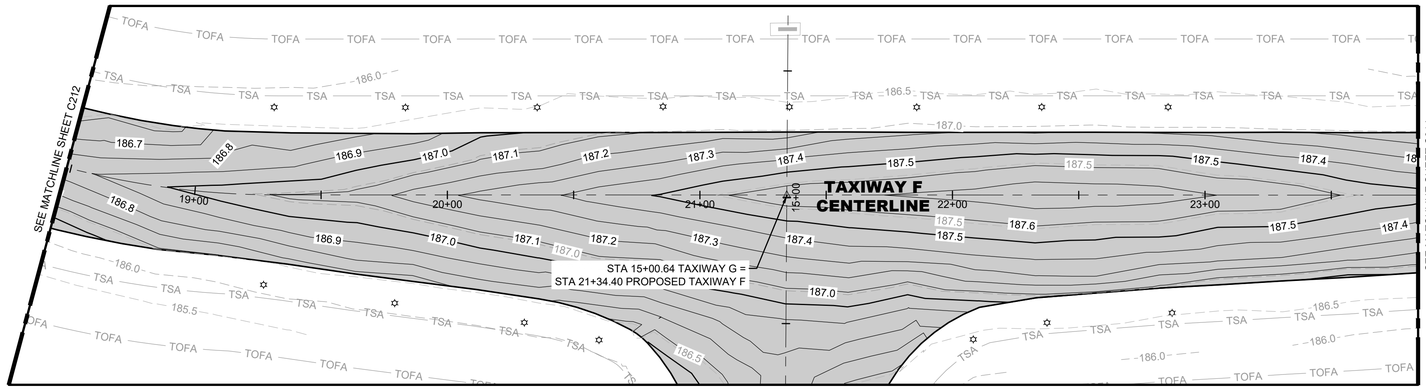

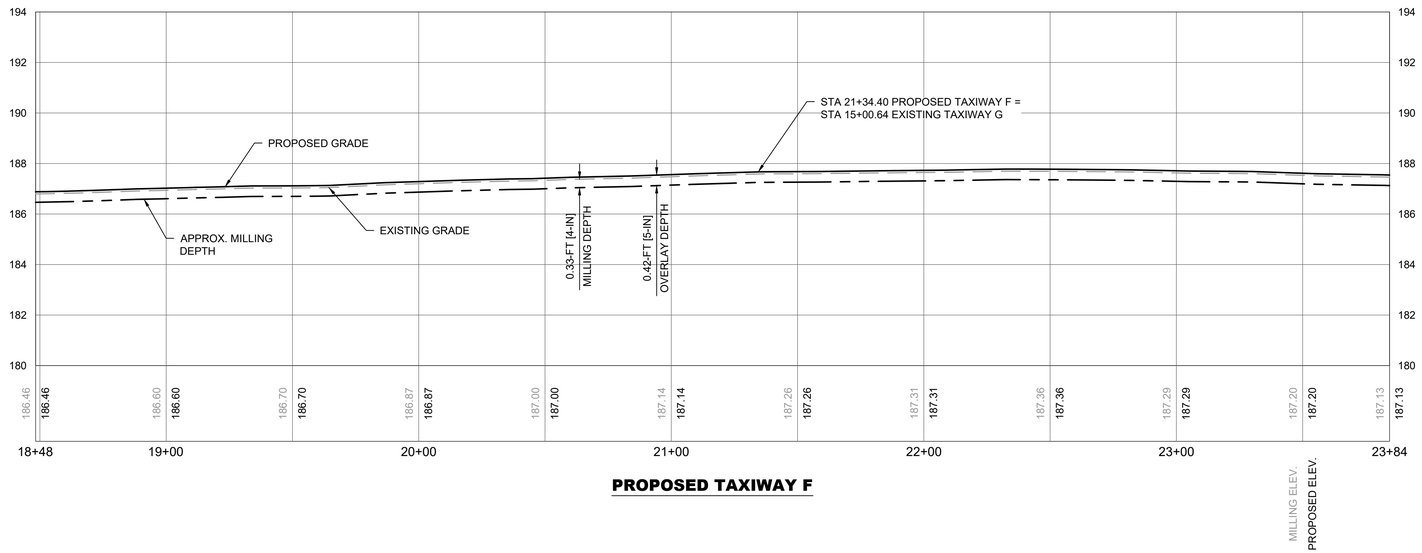

PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
- APPROXIMATE MILLINGS DEPTH
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

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2. REFER TO SHEETS C320 - C325 FOR THE FINAL ELEVATION PLANS.
3. CONTRACTOR IS RESPONSIBLE FOR MATCHING EXISTING GRADE IN THE 5 INCH OVERLAY AREA AS SPECIFIED. SUBMIT SURVEY OF FINAL GRADES TO RPR FOR REVIEW AND ACCEPTANCE.
4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

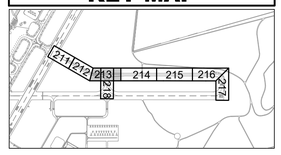
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (3 OF 7)

SHEET NUMBER

C213

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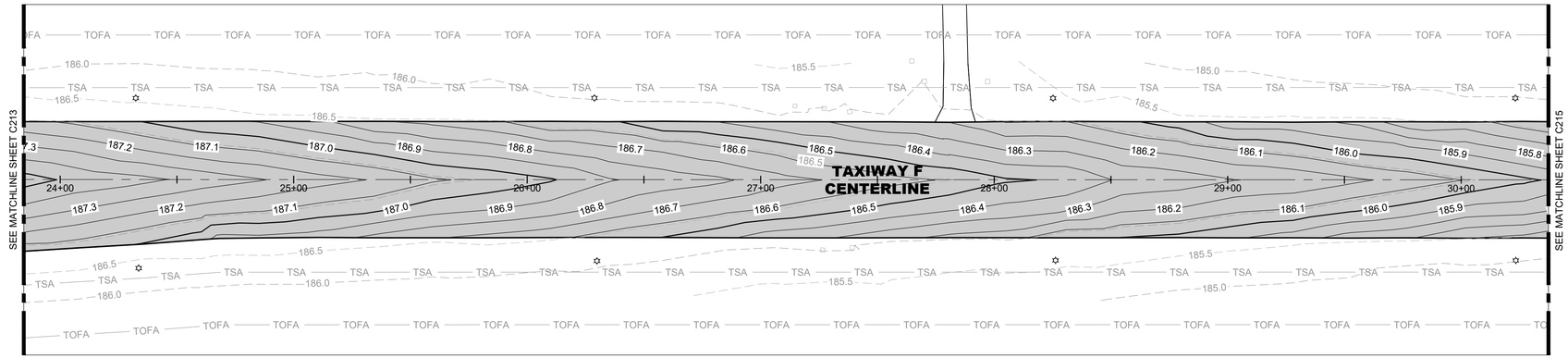

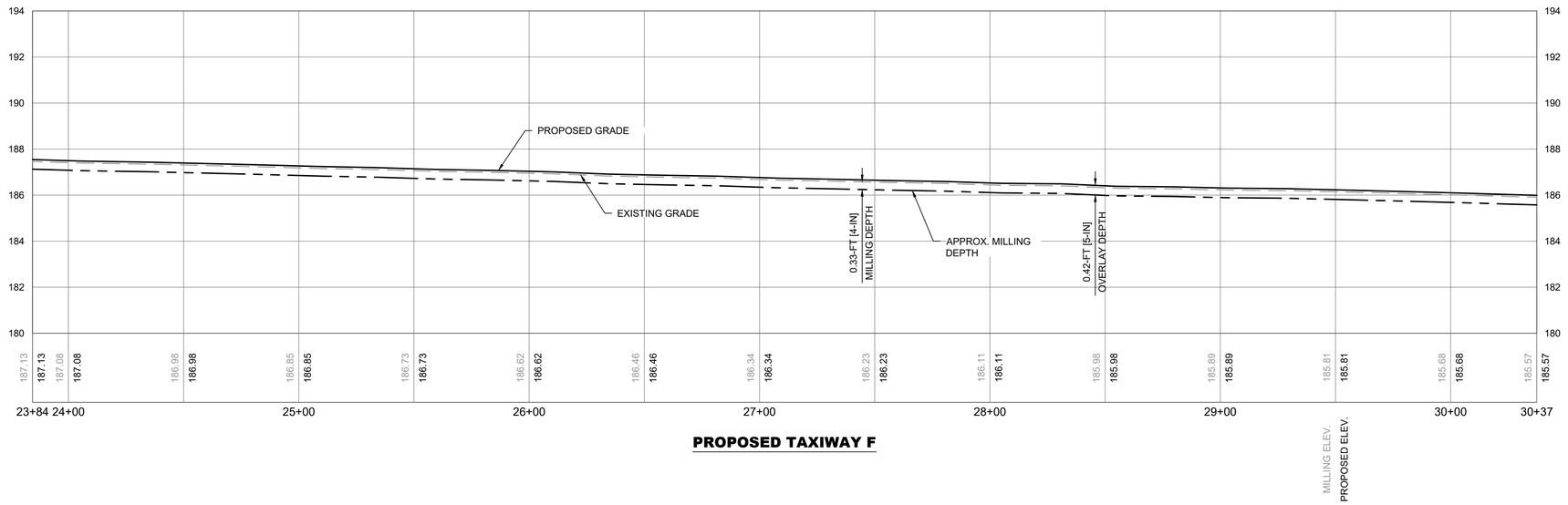

PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
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- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

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4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

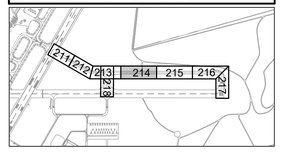
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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SHEET TITLE

TAXIWAY F PLAN AND PROFILE (4 OF 7)

SHEET NUMBER

C214

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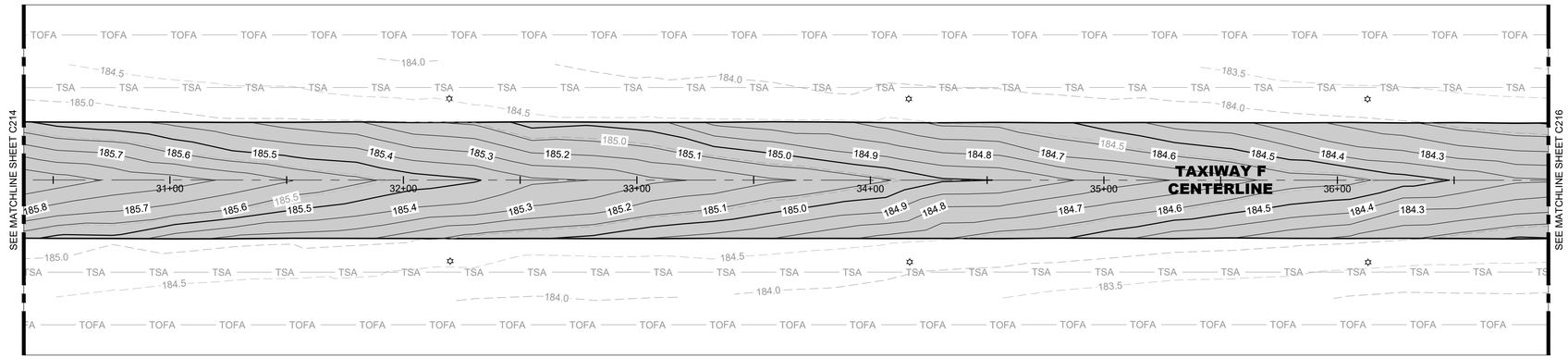
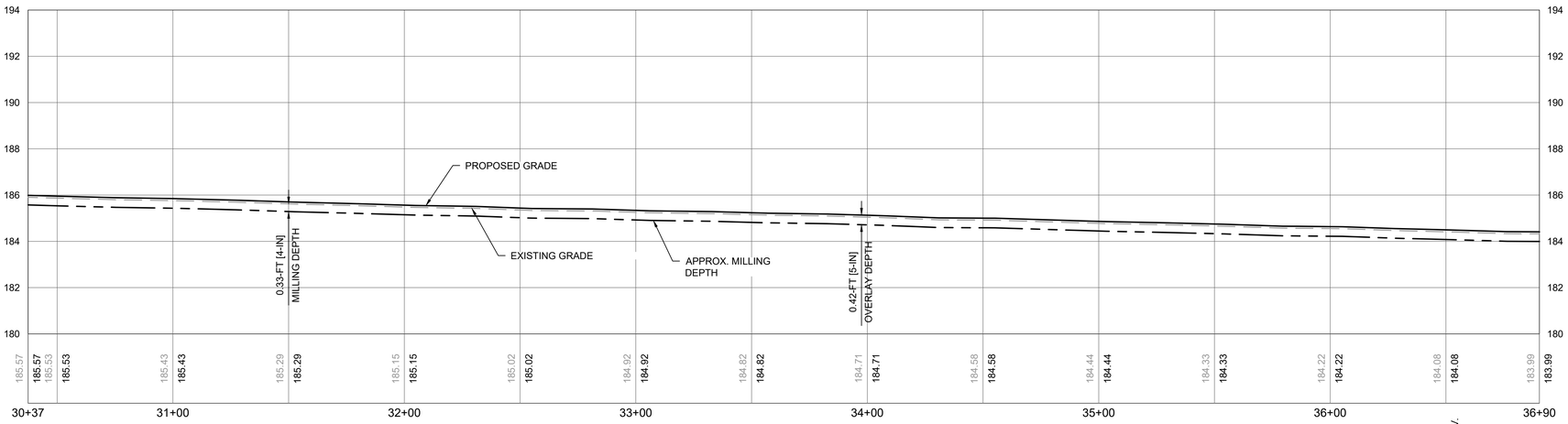
Plotted by: Odom, Stephen





PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
- APPROXIMATE MILLINGS DEPTH
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

1. REFER TO SHEET C231 FOR TYPICAL SECTIONS.
2. REFER TO SHEETS C320 - C325 FOR THE FINAL ELEVATION PLANS.
3. CONTRACTOR IS RESPONSIBLE FOR MATCHING EXISTING GRADE IN THE 5 INCH OVERLAY AREA AS SPECIFIED. SUBMIT SURVEY OF FINAL GRADES TO RPR FOR REVIEW AND ACCEPTANCE.
4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

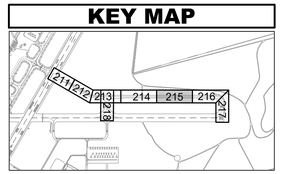
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (5 OF 7)

SHEET NUMBER

C215

BIDDING DOCUMENTS

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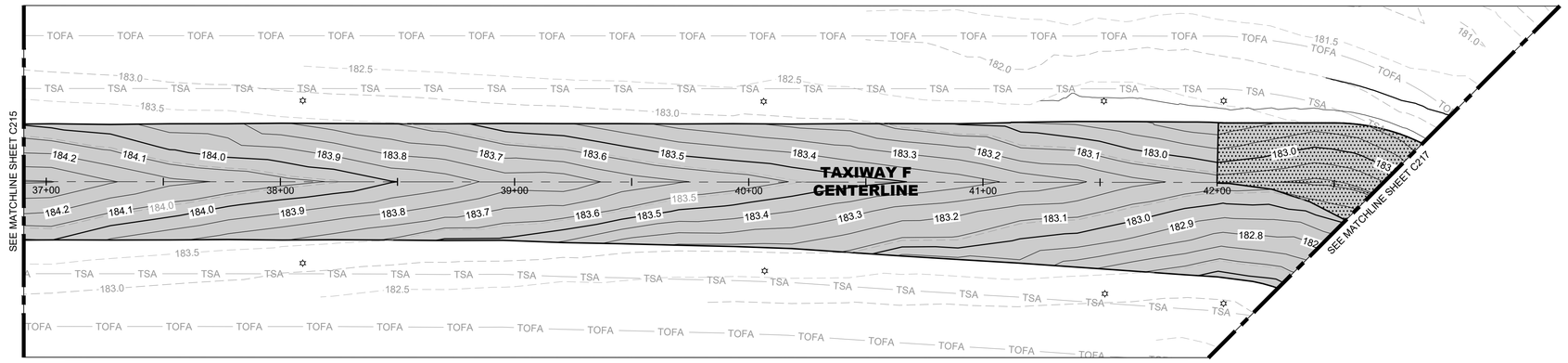

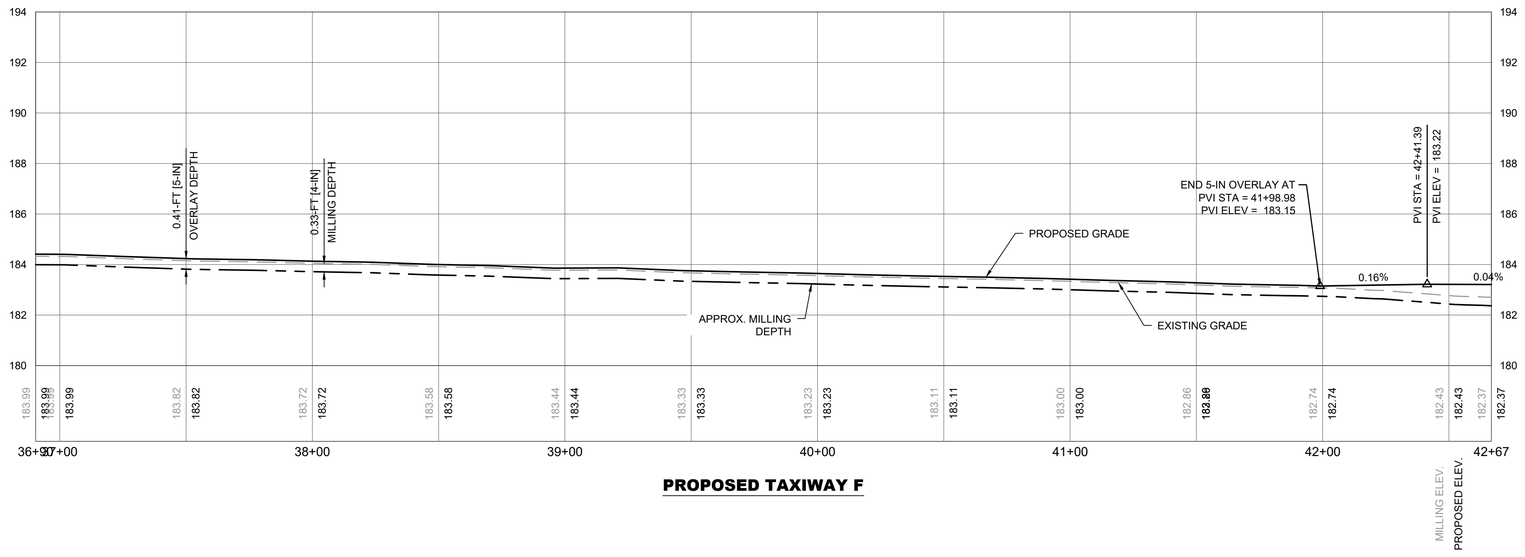

PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
- APPROXIMATE MILLINGS DEPTH
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')

NOTES

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4. THE TAXIWAY HAS AN OFF CENTER CROWN, REFER TO THE FINAL ELEVATION PLANS FOR CROWN ELEVATION AND POSITION.

VERTICAL SCALE

3' 0' 3' 6'

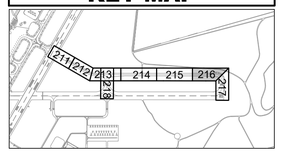
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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FAYETTEVILLE, NC

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REVISIONS

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (6 OF 7)

SHEET NUMBER

C216

BIDDING DOCUMENTS

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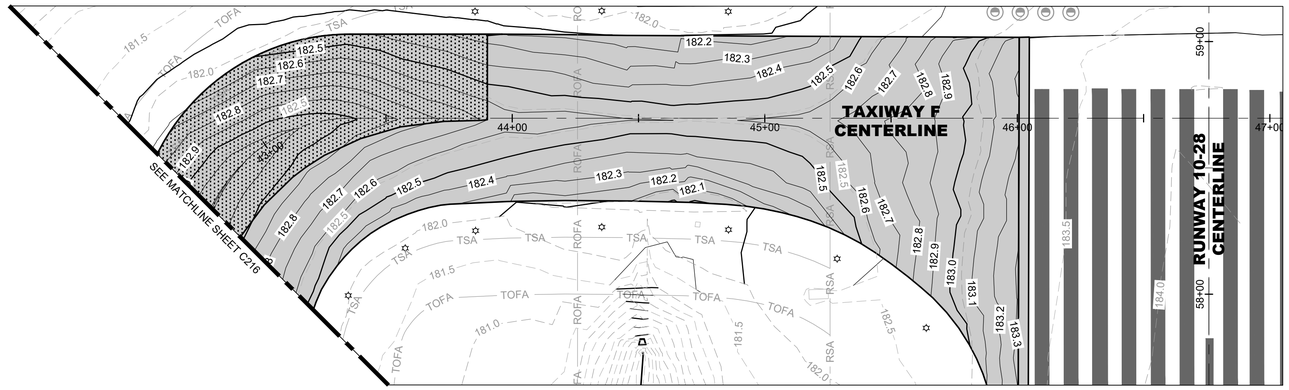

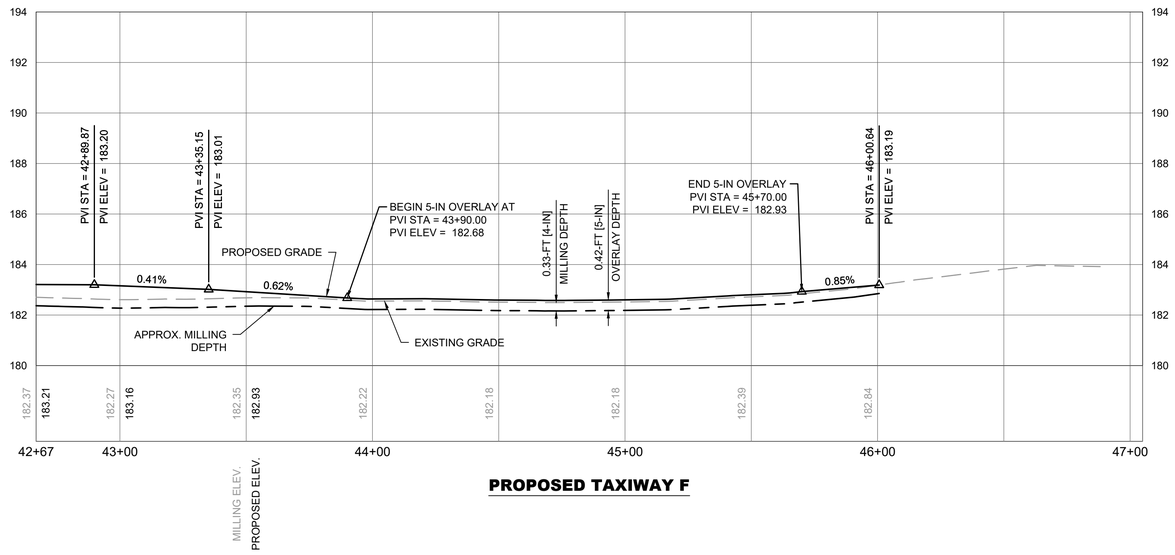

PROPOSED TAXIWAY F

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
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- PROPOSED TAXIWAY PROFILE
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VERTICAL SCALE

3' 0' 3' 6'

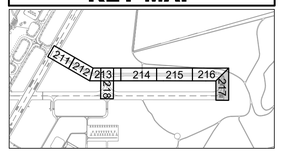
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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FAYETTEVILLE, NC

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DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY F PLAN AND PROFILE (7 OF 7)

SHEET NUMBER

C217

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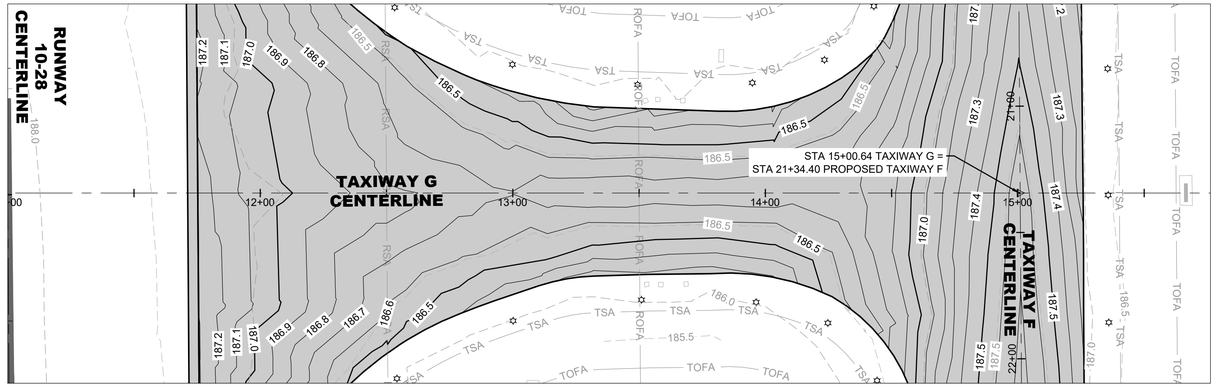

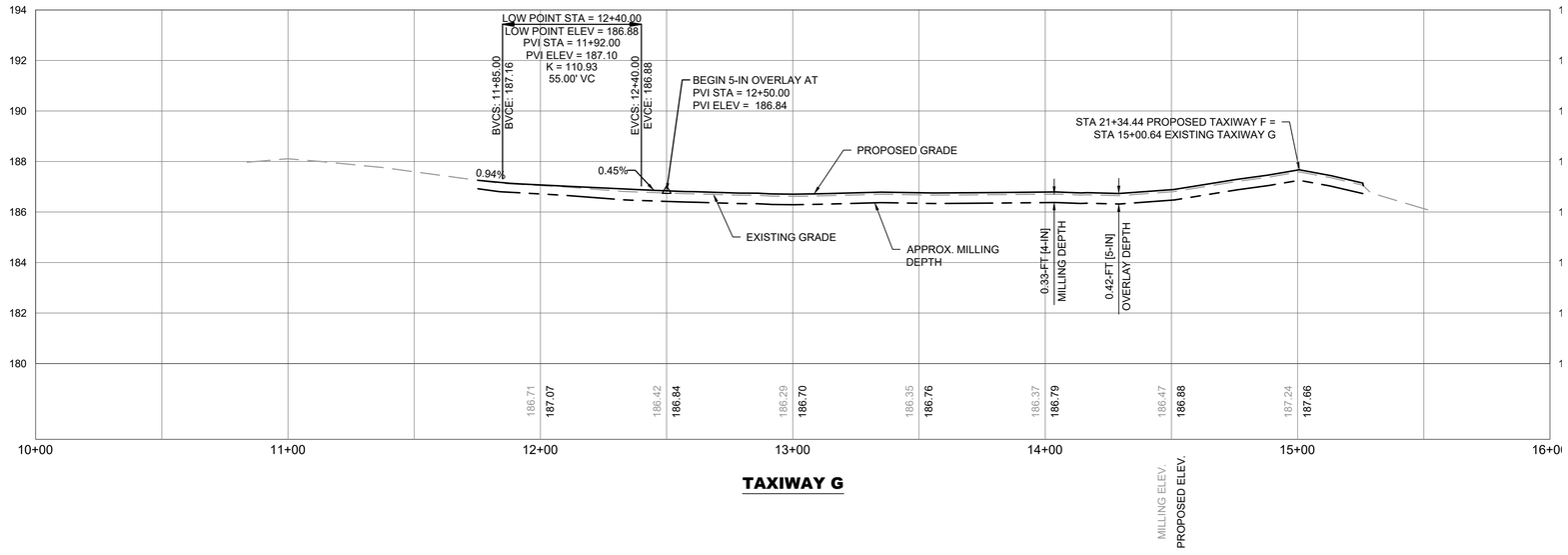

TAXIWAY G

LEGEND

- PROPOSED MILL AND OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
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- TAXIWAY CENTERLINE
- PROPOSED TAXIWAY PROFILE
- EXISTING TAXIWAY PROFILE
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- XXX.X — EXISTING MAJOR CONTOUR (1')
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VERTICAL SCALE

3' 0' 3' 6'

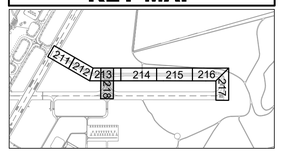
1" = 3'

HORIZONTAL SCALE

30' 0' 30' 60'

1" = 30'

KEY MAP



NORTH

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FAYETTEVILLE, NC

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

TAXIWAY G PLAN AND PROFILE

SHEET NUMBER

C218

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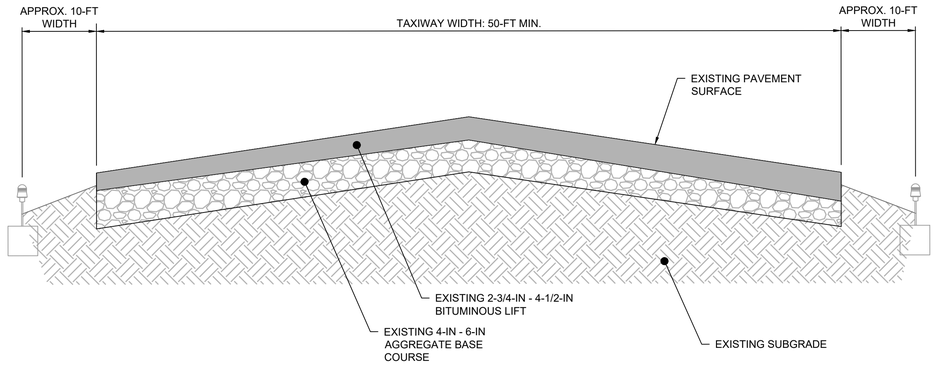
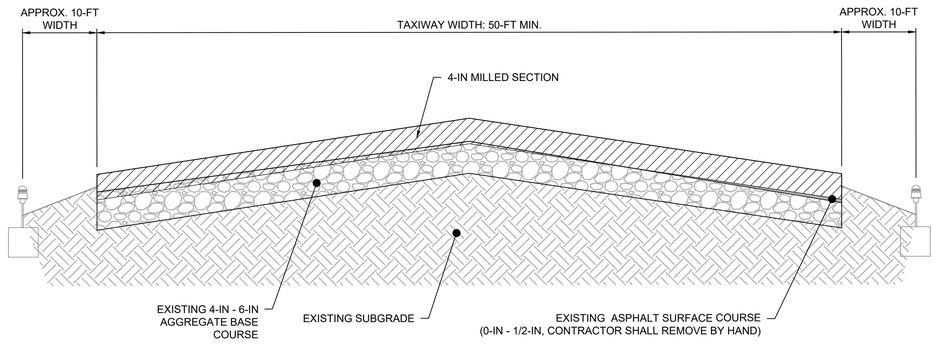


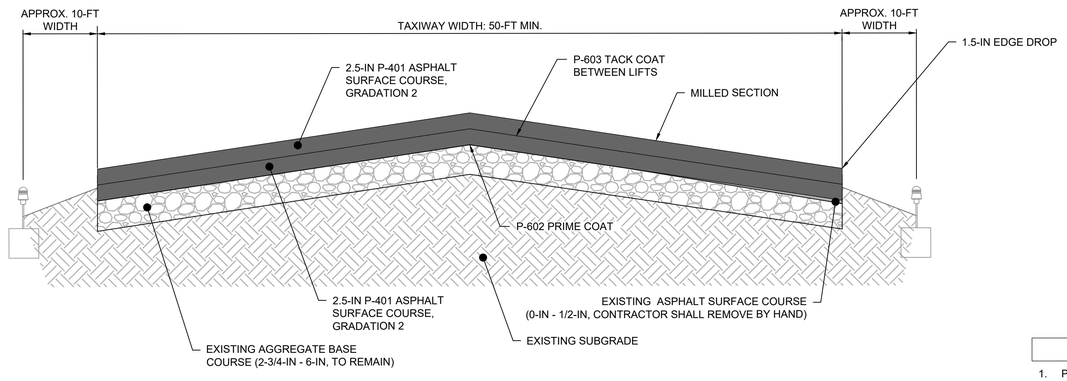
1 EXISTING TAXIWAY PAVEMENT SECTION

NTS



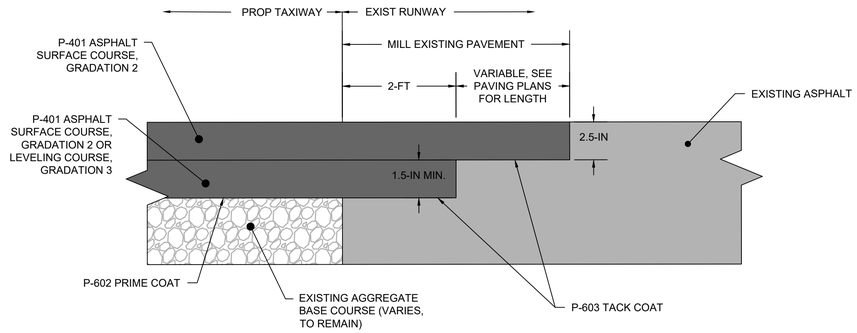
2 TAXIWAY MILLED PAVEMENT SECTION

NTS



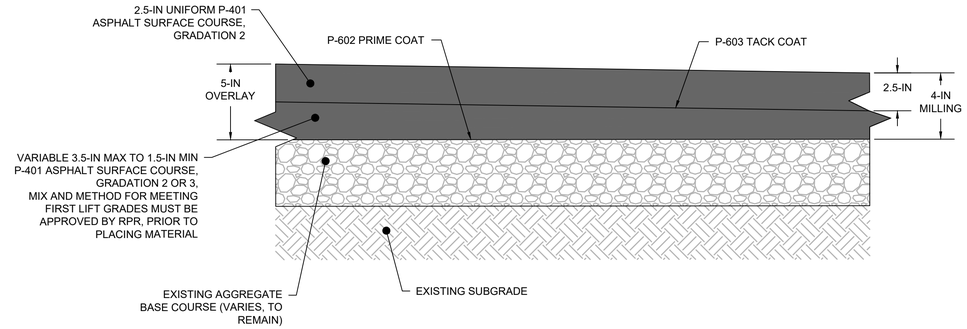
3 PROPOSED TAXIWAY OVERLAY SECTION

NTS



4 PROPOSED TW/EXIST RW KEY-IN

NTS



NOTES:

1. INTERMEDIATE SPOT ELEVATIONS HAVE BEEN PROVIDED ON SHEET C311 WHICH ELEVATIONS INDICATE THE TOP OF THE FIRST LIFT COMPARED TO THE ELEVATION FOLLOWING THE 4-IN MILLING OPERATION.

5 PROPOSED TAXIWAY TIE-IN SECTION

NTS

TYPICAL SECTIONS GENERAL NOTES

1. P-603 TACK COAT SHALL BE APPLIED TO ALL EXISTING AND PROPOSED INTERMEDIATE ASPHALT LIFTS AND VERTICAL JOINT FACES.
2. ALL COLD JOINTS AND MILLED EDGE TIE-INS SHALL BE SAWCUT PER SPECIFICATION P-109.

LEGEND

- MILLED SECTION
- EXISTING AGGREGATE BASE COURSE
- PROPOSED P-209 AGGREGATE BASE COURSE
- EXISTING SUBGRADE
- PROPOSED P-152 COMPACTED SUBGRADE
- P-401 ASPHALT SURFACE COURSE
- EXISTING ASPHALT

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REVIEWED BY:	AEB

SHEET TITLE

TYPICAL SECTIONS (1 OF 2)

SHEET NUMBER

C231

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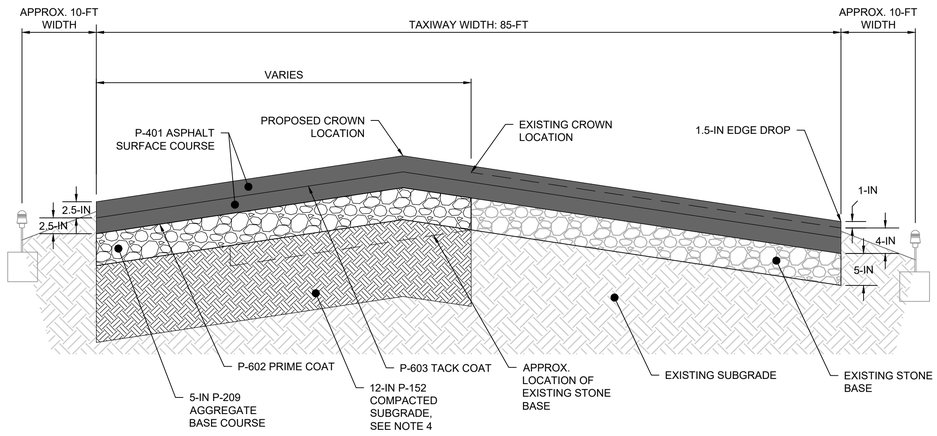
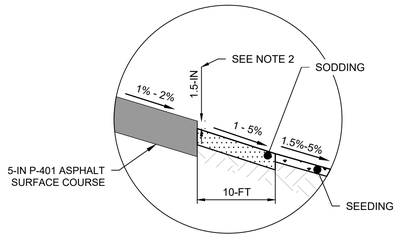


1 PROPOSED TAXIWAY FULL DEPTH SECTION

NTS

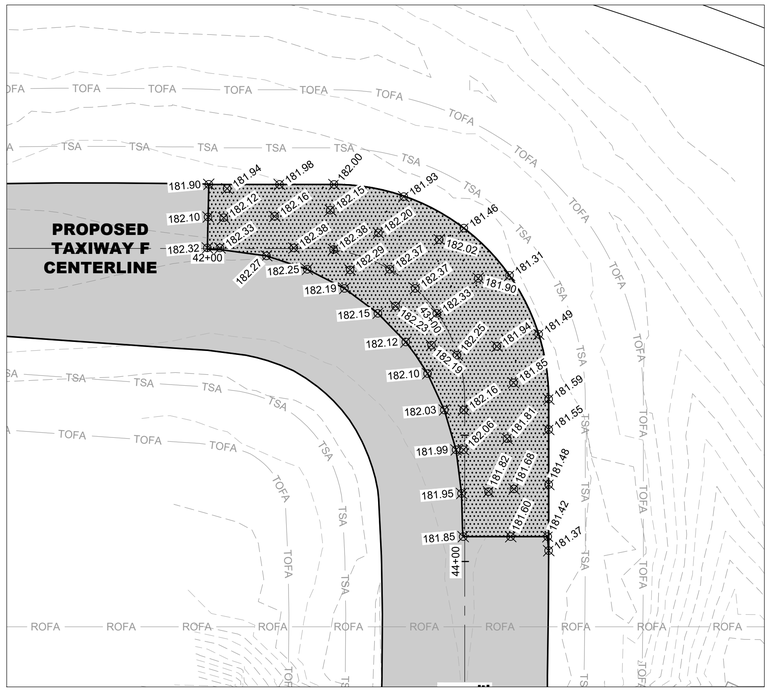
FULL DEPTH SECTION NOTES:

1. APPLY SEEDING AND SODDING IN AREAS AS INDICATED BY THE GRADING PLANS AND DETAIL SHEETS.
2. 1.5-IN PAVEMENT EDGE MUST BE PROVIDED WHEN SHOULDER IS RE-GRADED AS INDICATED BY THE GRADING PLANS.
3. CONTRACTOR MAY UTILIZE EXISTING CENTERLINE MARKING IN PLACE OF STA. OFFSETS INDICATED IN INSET C.
4. INSET B PROVIDES SUBGRADE TOP ELEVATIONS AFTER MEETING P-152 COMPACTION REQUIREMENTS.



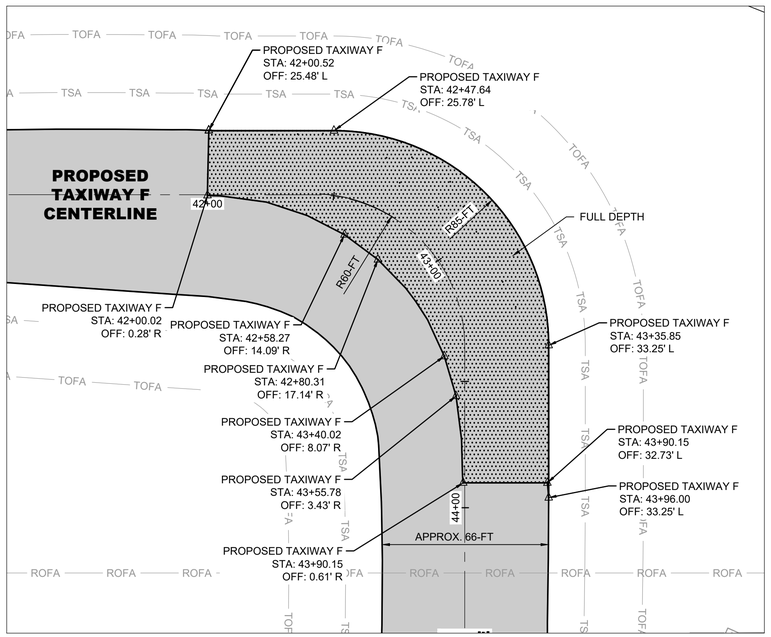
A TEMPORARY TAXIWAY PAVEMENT EDGE DETAIL

NTS



B SUBGRADE ELEVATION INSET

NTS



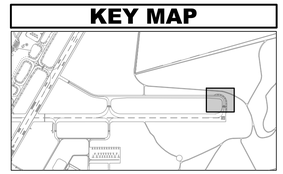
C FULL DEPTH PAVEMENT LIMITS

NTS

LEGEND

- P-401 ASPHALT OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ASPHALT PAVEMENT TIE-IN
- ASPHALT PAVEMENT KEY-IN
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING AGGREGATE BASE COURSE
- PROPOSED P-209 AGGREGATE BASE COURSE
- EXISTING SUBGRADE
- PROPOSED P-152 COMPACTED SUBGRADE
- P-401 ASPHALT SURFACE COURSE
- XXX.XX — SUBGRADE ELEVATION
- XXX.XX / XXX.XX — FIRST ASPHALT LIFT TOP ELEV MILLING ELEVATION

KEY MAP



NORTH

SCALE (IN FEET)
30 0 30 60
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE

TYPICAL SECTIONS (2 OF 2)

SHEET NUMBER

C232

BIDDING DOCUMENTS

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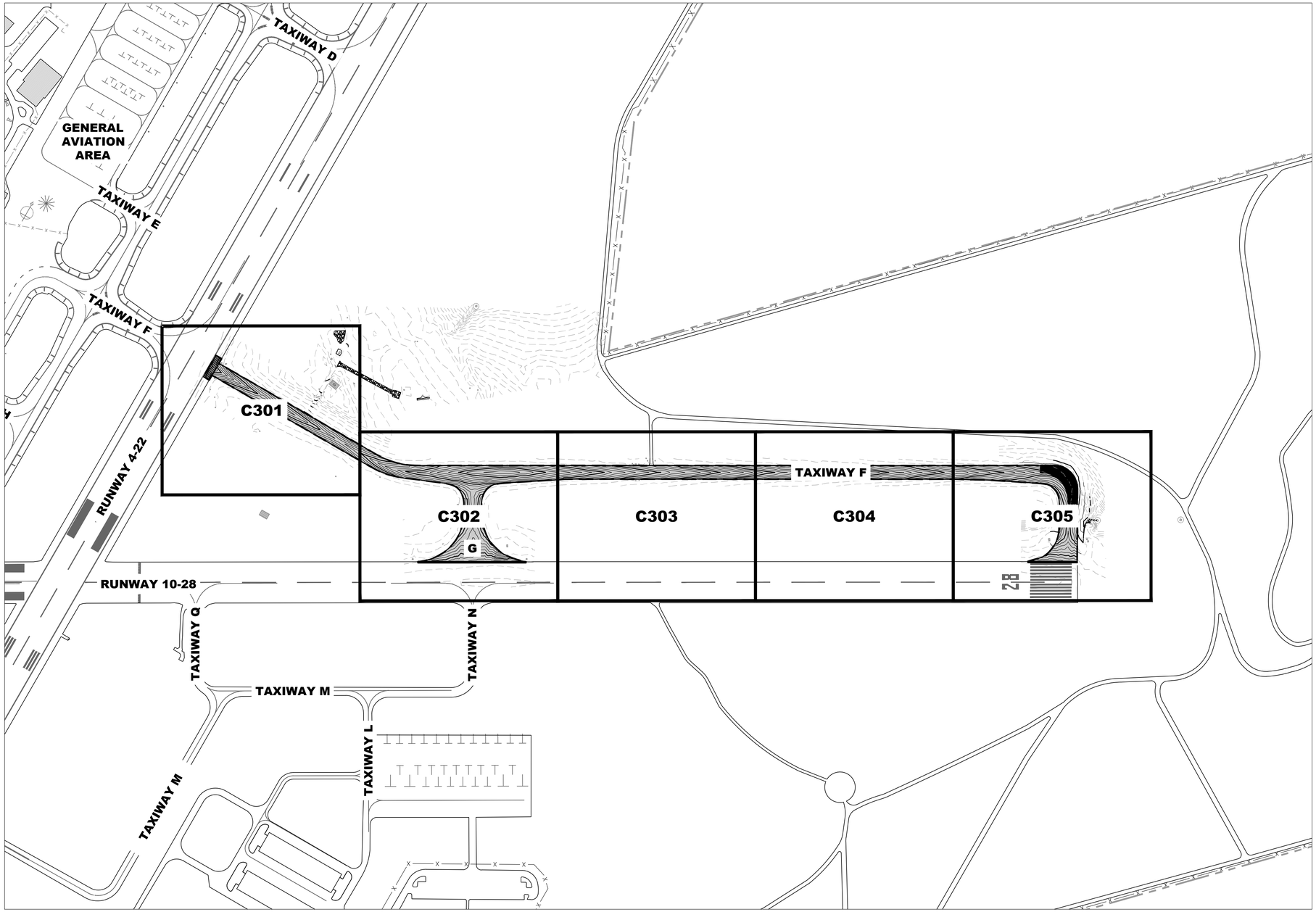
Plotted by: Odom, Stephen



LEGEND

- AOA FENCE
- AIRPORT PROPERTY LIMITS
- P-401 ASPHALT OVERLAY
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')

NORTH

SCALE (IN FEET)
200 0 200 400
1 INCH = 200 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\1003183000S_FAY Rehab of TW F and G\Project Files\C\C300.dwg
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DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

GRADING KEY MAP

SHEET NUMBER

C300

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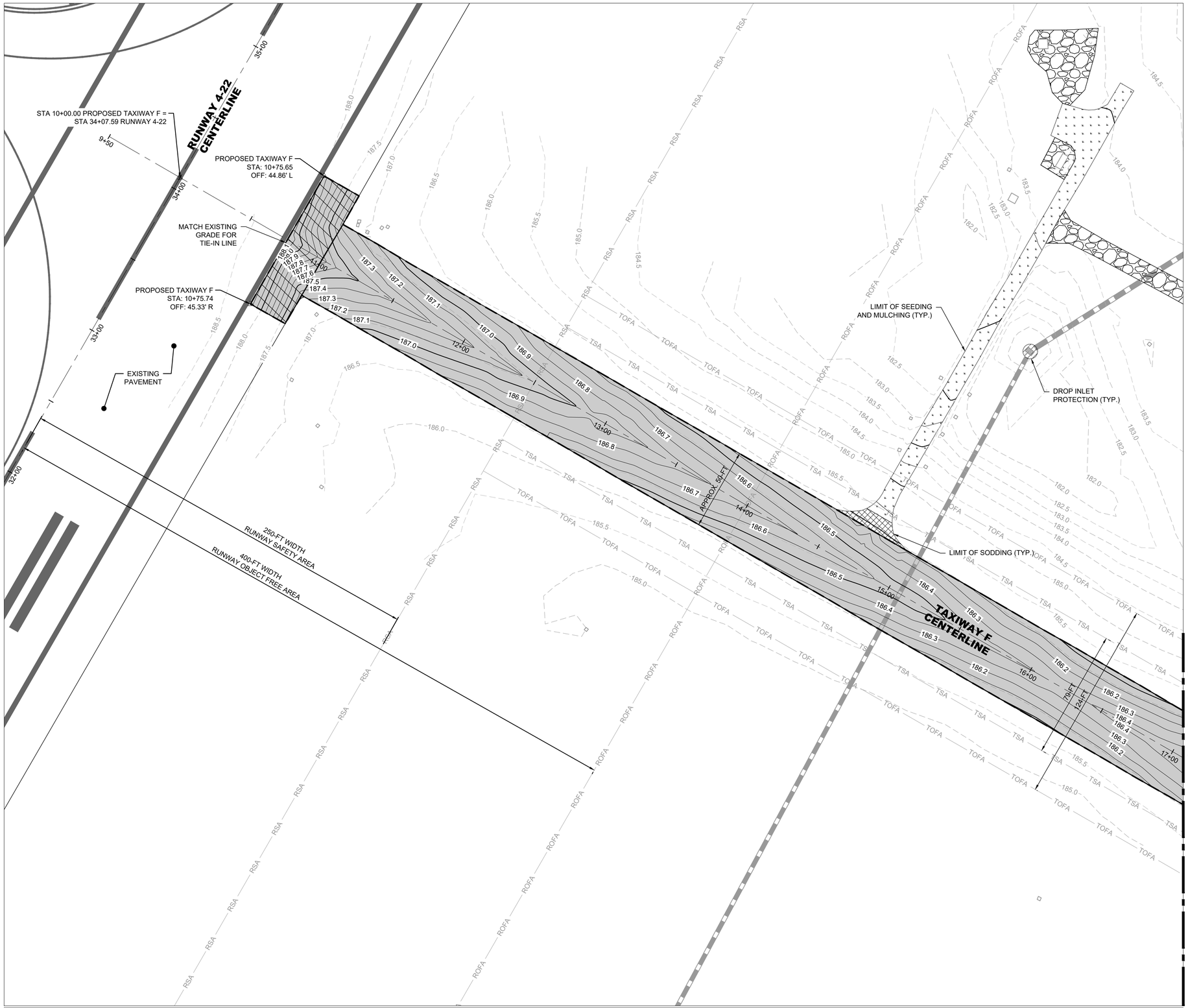

LEGEND

- P-401 ASPHALT OVERLAY
- GRAVEL DRIVE
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — AOA FENCE
- XXX.X — EXISTING MAJOR CONTOUR (1')
- XXX.X — EXISTING MINOR CONTOUR (0.5')
- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')
- LIMITS OF GRADING
- PROPOSED DROP INLET PROTECTION
- COMPOST SOCK
- PROPOSED ROCK PIPE INLET PROTECTION
- SODDING LIMITS
- SEEDING AND MULCHING LIMITS
- ASPHALT PAVEMENT TIE IN

NOTES

1. NO WORK ON-SITE MAY BEGIN UNTIL INSTALLATION OF ROCK PIPE INLET PROTECTION, DROP INLET PROTECTION, COMPOST SOCK, AND SILT FENCE
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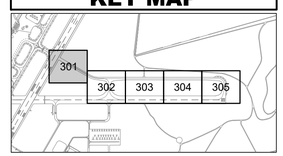
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

1 INCH = 30 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\C\C300.dwg

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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

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REVISIONS

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

GRADING PLAN (1 OF 5)

SHEET NUMBER

C301

BIDDING DOCUMENTS

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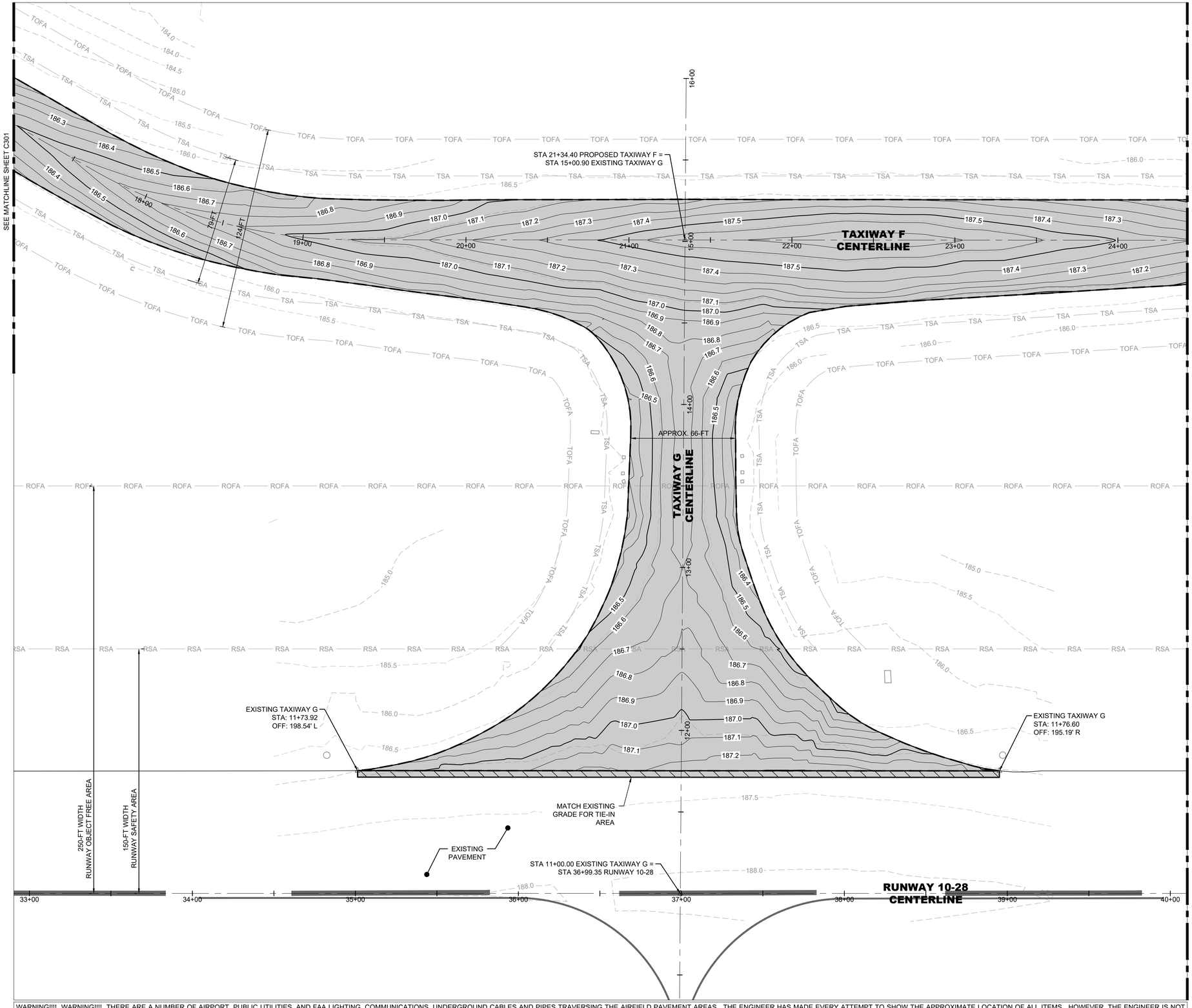

LEGEND

- P-401 ASPHALT OVERLAY
- GRAVEL DRIVE
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
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- XXX.X — PROPOSED MAJOR CONTOUR (0.5')
- XXX.X — PROPOSED MINOR CONTOUR (0.1')
- LIMITS OF GRADING
- PROPOSED DROP INLET PROTECTION
- COMPOST SOCK
- PROPOSED ROCK PIPE INLET PROTECTION
- SODDING LIMITS
- SEEDING AND MULCHING LIMITS
- ASPHALT PAVEMENT TIE IN

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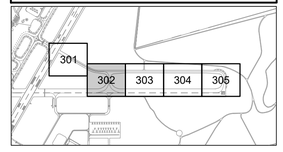
KEY MAP



NORTH

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

GRADING PLAN (2 OF 5)

SHEET NUMBER

C302

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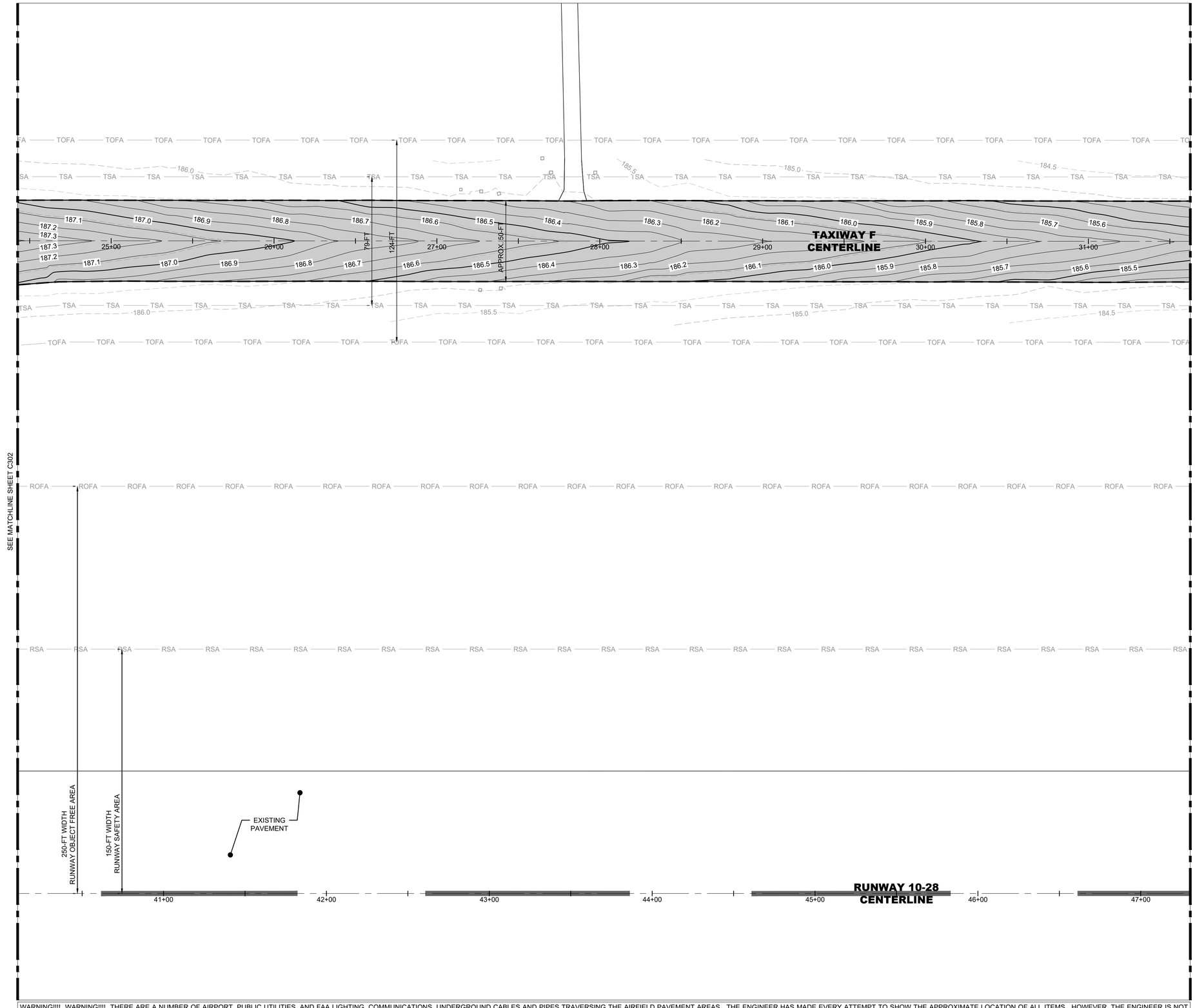

LEGEND

- P-401 ASPHALT OVERLAY
- GRAVEL DRIVE
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
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- X — AOA FENCE
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- LIMITS OF GRADING
- PROPOSED DROP INLET PROTECTION
- COMPOST SOCK
- PROPOSED ROCK PIPE INLET PROTECTION
- SODDING LIMITS
- SEEDING AND MULCHING LIMITS
- ASPHALT PAVEMENT TIE IN

NOTES

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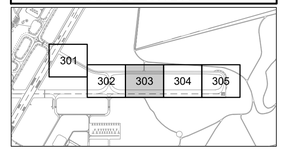
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

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REVISIONS

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DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

GRADING PLAN (3 OF 5)

SHEET NUMBER

C303

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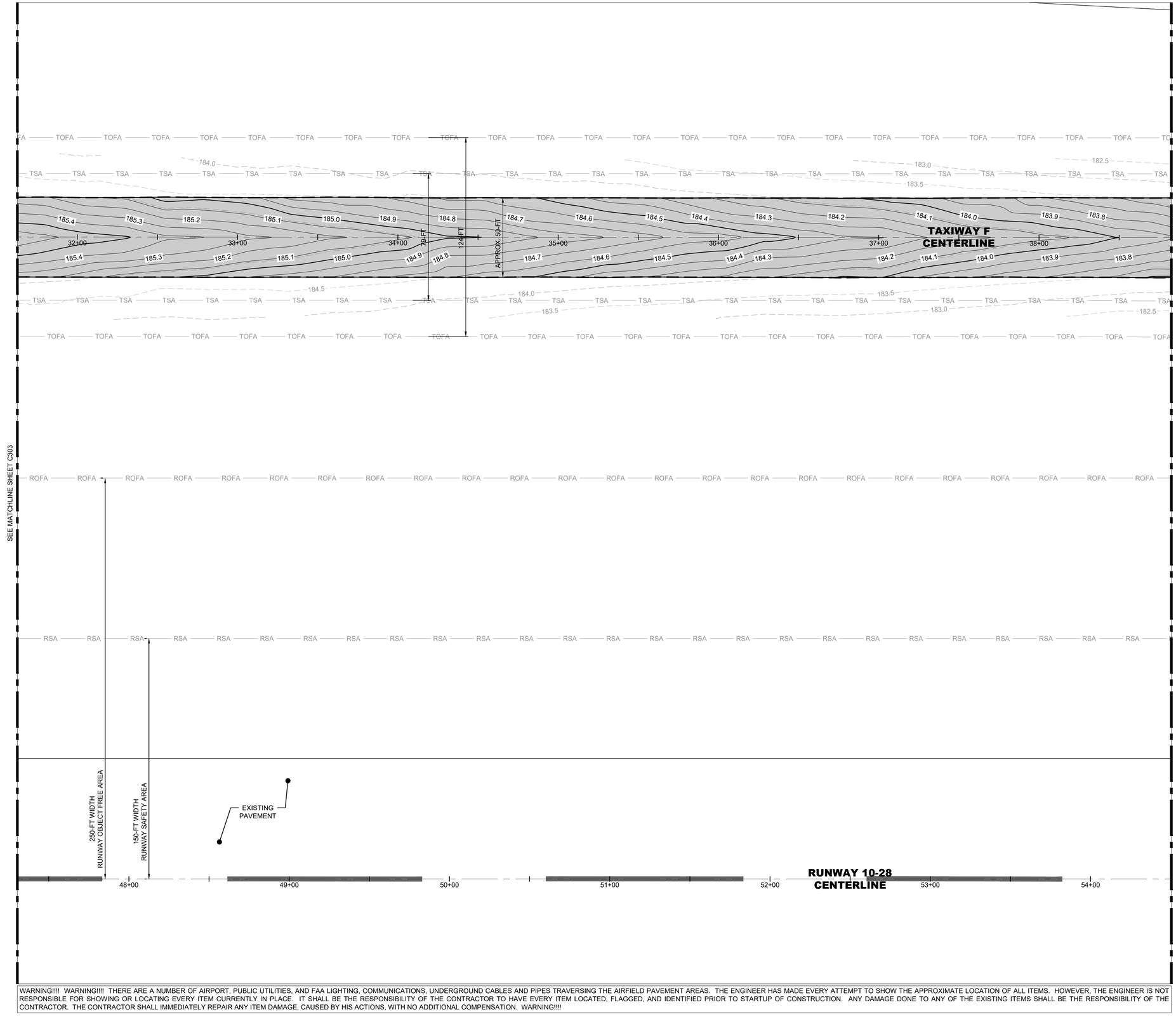

LEGEND

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- GRAVEL DRIVE
- FULL DEPTH ASPHALT PAVEMENT SECTION
- RSA — RUNWAY SAFETY AREA
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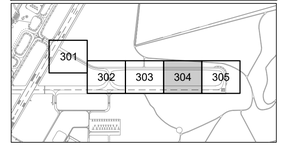

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REVIEWED BY:	AEB

SHEET TITLE

GRADING PLAN (4 OF 5)

SHEET NUMBER

C304

BIDDING DOCUMENTS

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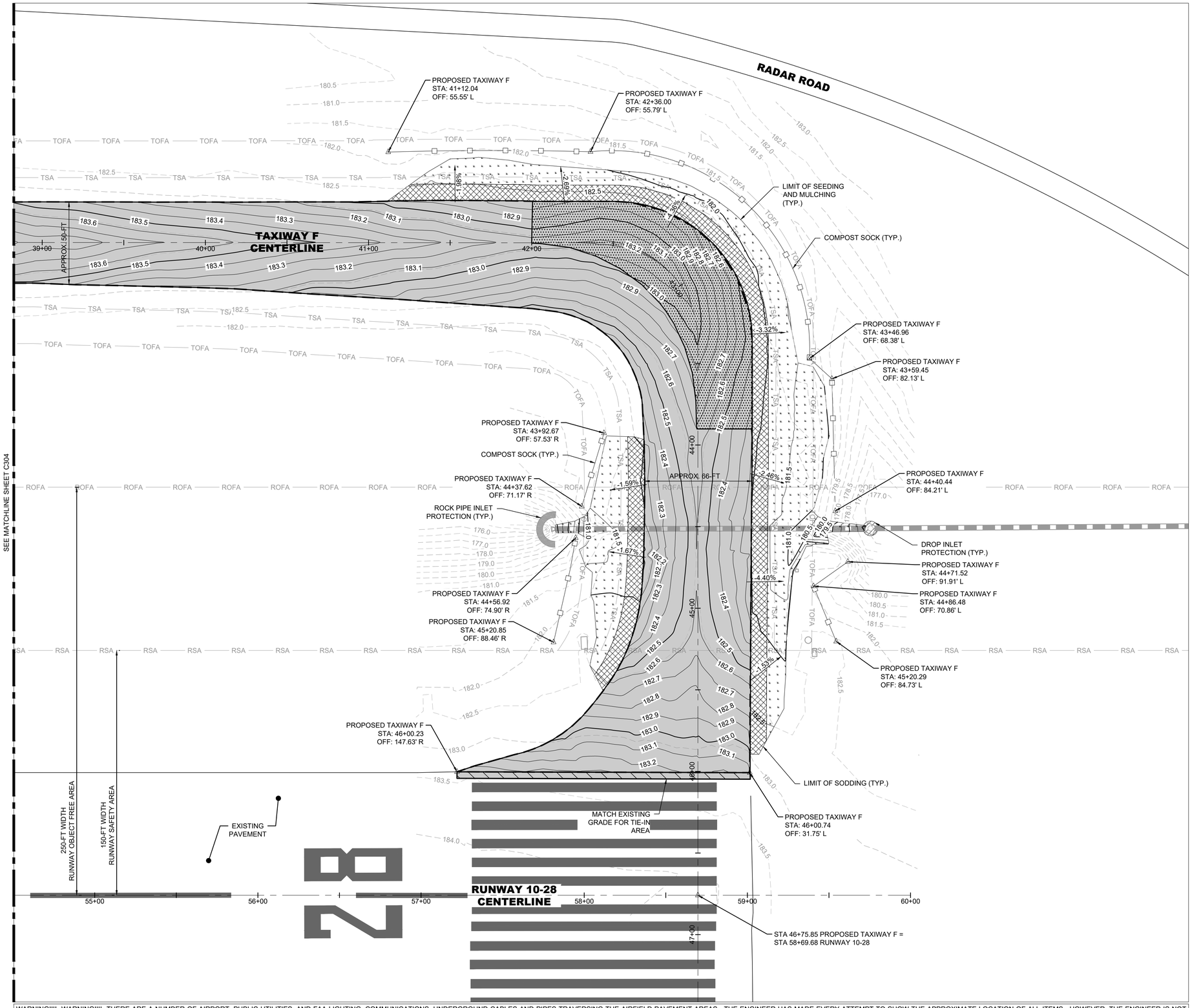

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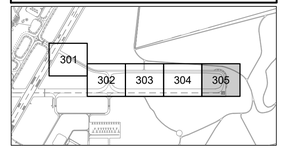
3. SILT FENCING SHALL BE USED FOR THE BORDERS OF STAGING AREA AND STOCKPILED MATERIAL LOCATIONS AS NEEDED.
4. THE CONTRACTOR SHALL NOT MEET OR EXCEED MORE THAN ONE ACRE OF LAND DISTURBANCE AT ANY TIME.
5. ALL EROSION CONTROL METHODS WILL BE IN ACCORDANCE WITH THE MOST CURRENT NCDEQ NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
6. AS CONSTRUCTION ACTIVITIES COMMENCE FOR THE REMOVAL OF TOPSOIL OF THE EXISTING GRADE FOR THE PROPOSED SHOULDER OR TAXIWAYS, THE CONTRACTOR SHALL IMMEDIATELY STABILIZE AND COMPACT THE SUBGRADE AND PLACE THE AGGREGATE BASE COURSE TO HELP CONTROL EROSION AND SEDIMENTATION.

KEY MAP



NORTH

SCALE (IN FEET)
30 0 30 60
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

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DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

GRADING PLAN (5 OF 5)

SHEET NUMBER

C305

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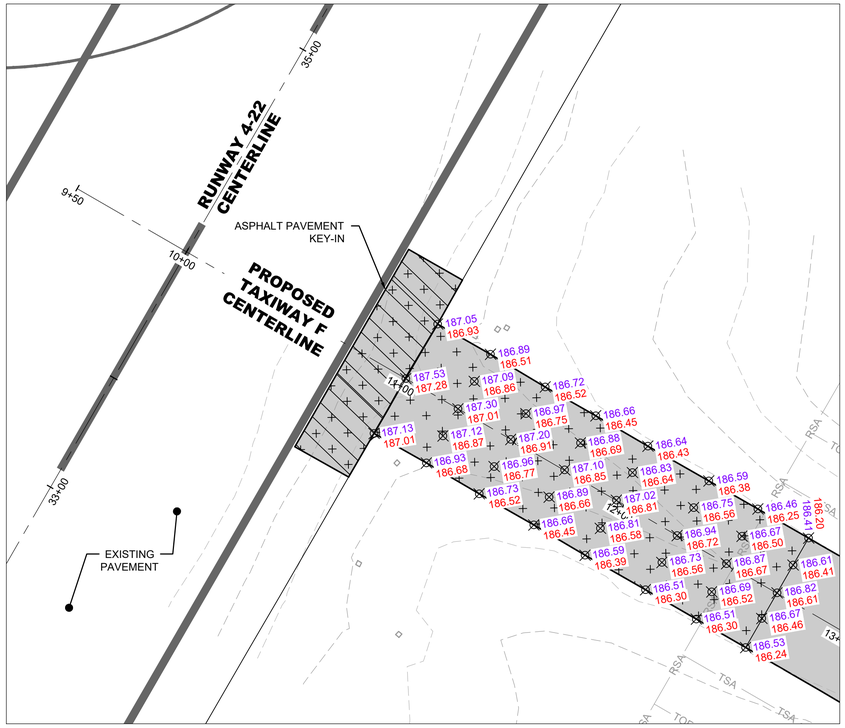
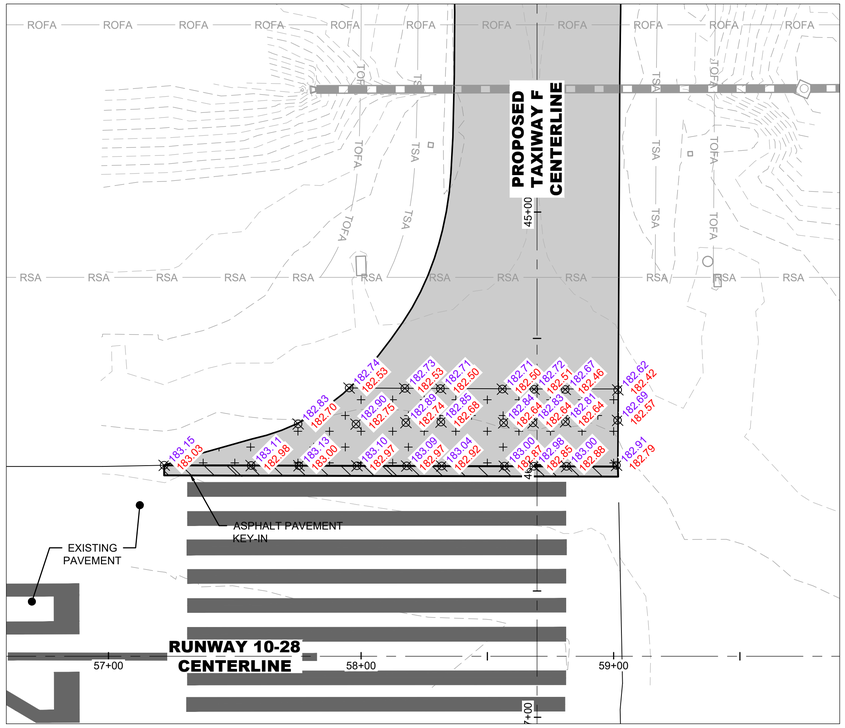


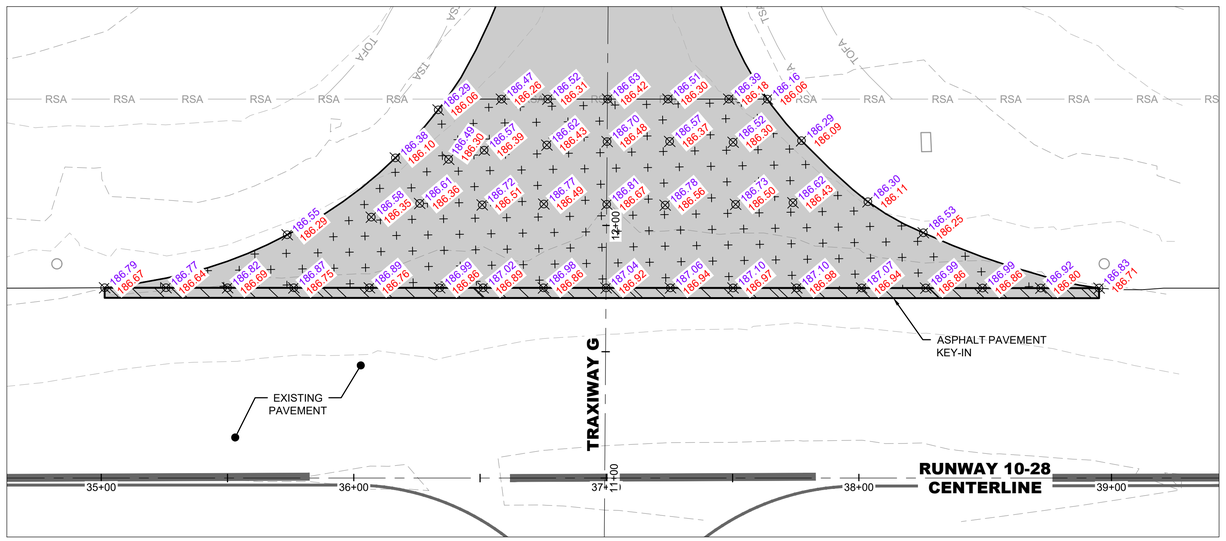
RUNWAY 4-22 TIE-IN FIRST LIFT ELEVATION INSET

A NTS



TW F TO RW 10-28 TIE-IN FIRST LIFT ELEVATION INSET

A NTS



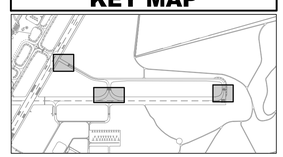
TW G TO RW 10-28 TIE-IN FIRST LIFT ELEVATION INSET

A NTS

LEGEND

- P-401 ASPHALT OVERLAY
- FULL DEPTH ASPHALT PAVEMENT SECTION
- ASPHALT PAVEMENT TIE-IN
- ASPHALT PAVEMENT KEY-IN
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- DRAINAGE PIPE
- EXISTING HEADWALL
- EXISTING INLET
- EXISTING CONCRETE PAD
- EXISTING DUCT BANK
- EXISTING STORM SEWER MANHOLE
- EXISTING TAXIWAY EDGE LIGHT
- EXISTING AGGREGATE BASE COURSE
- PROPOSED P-209 AGGREGATE BASE COURSE
- EXISTING SUBGRADE
- PROPOSED P-152 COMPACTED SUBGRADE
- P-401 ASPHALT SURFACE COURSE
- XXX.XX — SUBGRADE ELEVATION
- XXX.XX / XXX.XX — FIRST ASPHALT LIFT TOP ELEV MILLING ELEVATION

KEY MAP



NORTH

SCALE (IN FEET)
30 0 30 60
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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SHEET TITLE

INTERMEDIATE ELEVATION PLAN - TIE-INS

SHEET NUMBER

C311

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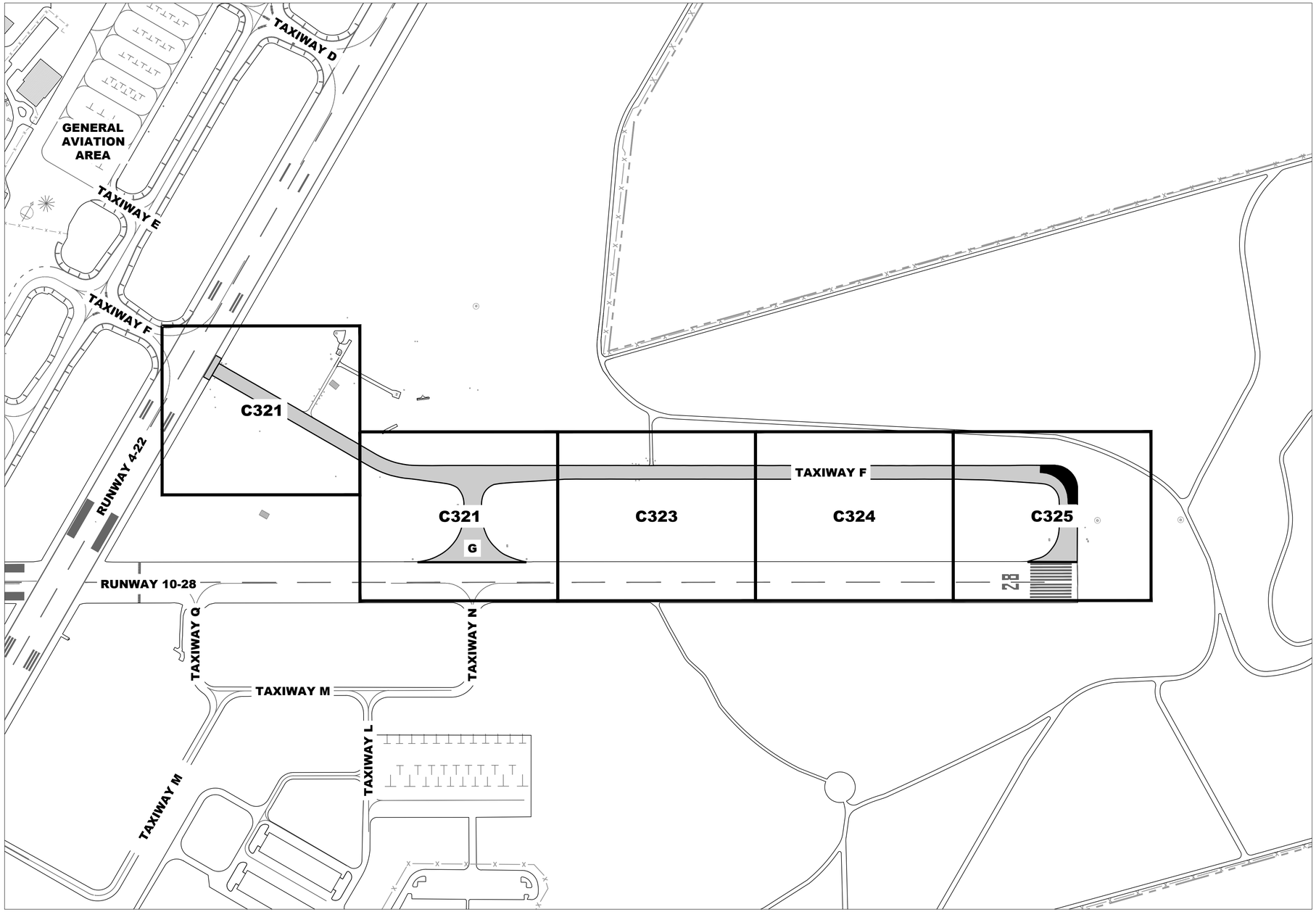

LEGEND

- EXISTING AOA FENCE
- AIRPORT PROPERTY LIMITS
- P-401 ASPHALT OVERLAY
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\C\C320.dwg Plotted on: 4/1/2026 5:40 PM Plotted by: Odom, Stephen

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REVIEWED BY:	AEB

SHEET TITLE

FINAL ELEVATION KEY MAP

SHEET NUMBER

C320

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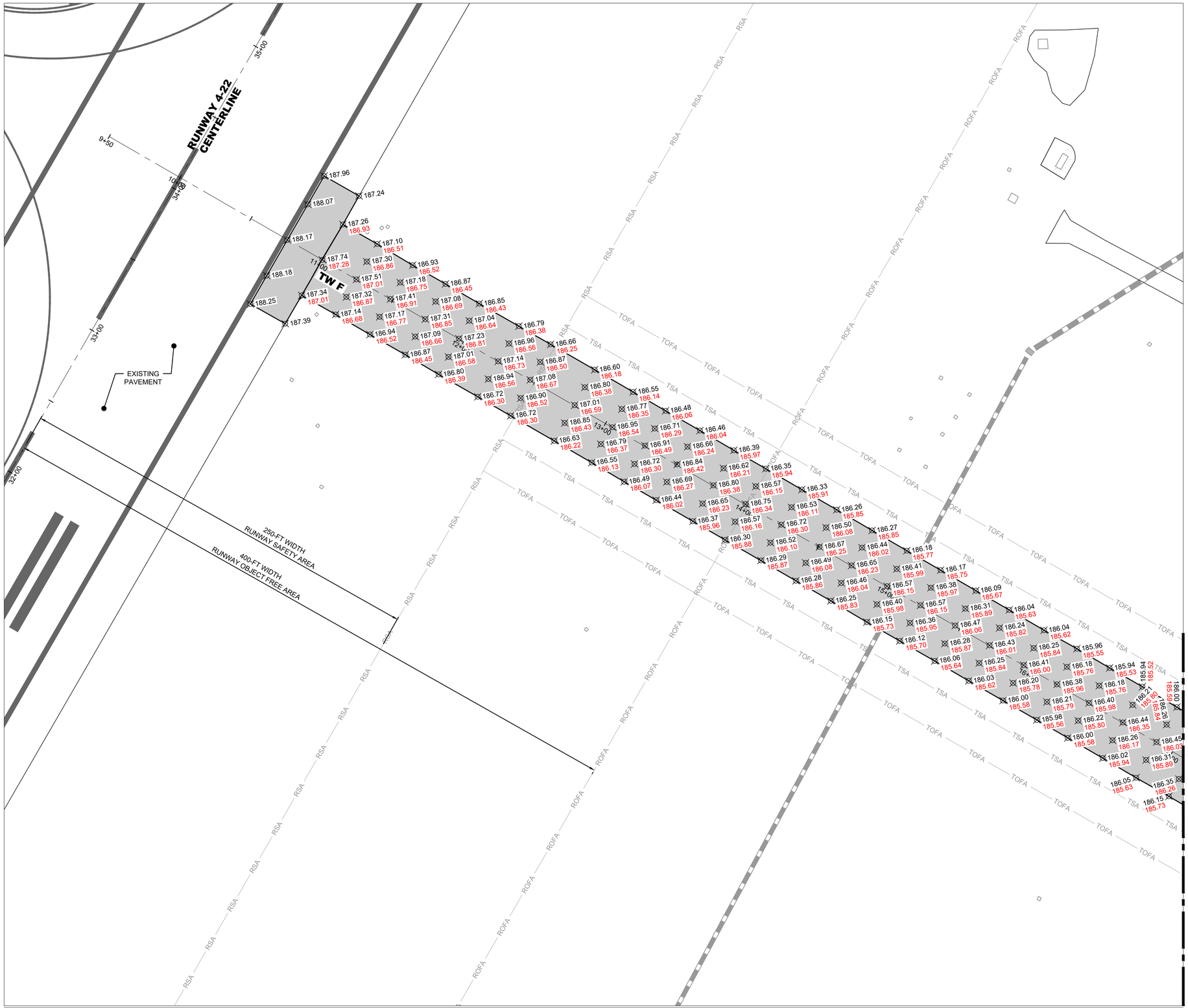


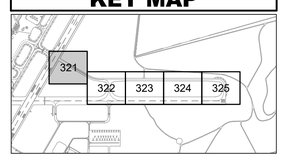
LEGEND

- P-401 ASPHALT OVERLAY
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — EXISTING AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- XXX.XX / XXX.XX — FINAL ELEVATION / MILLING ELEVATION
- XXX.XX / XXX.XX — FINAL ELEVATION / P-209 LAYER TOP ELEVATION

NOTES

1. THE FINAL ELEVATION PLAN PROVIDES ELEVATIONS SHOWING THE FINAL ASPHALT SURFACE LIFT COMPARED TO THE MILLING ELEVATION OR TOP OF P-209 ABC BASE ELEVATION. SEE LEGEND.
2. THE CONTRACTOR SHALL PROVIDE FINAL SURVEY DATA FOLLOWING FINAL LIFT COMPLETION FOR PAYMENT PER P-401 SPEC.
3. THE CONTRACTOR SHALL SUBMIT THE PROPOSED SURVEY GRID PATTERN TO VERIFY SPOT ELEVATIONS, FOR APPROVAL BY THE ENGINEER. IT MUST MATCH THE SURVEYED GRID PATTERN, EXCEPT AS NOTED BY THE RPR. THE TAXIWAY HAS AN OFF CENTER CROWN; THEREFORE SPOT ELEVATIONS ON THIS PLAN PROVIDE THE MOST ACCURATE CROWN POSITION.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

1 INCH = 30 FEET (WHEN PRINTED 34"x22")

Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\C\C320.dwg

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FINAL ELEVATION PLAN (1 OF 5)

SHEET NUMBER

C321

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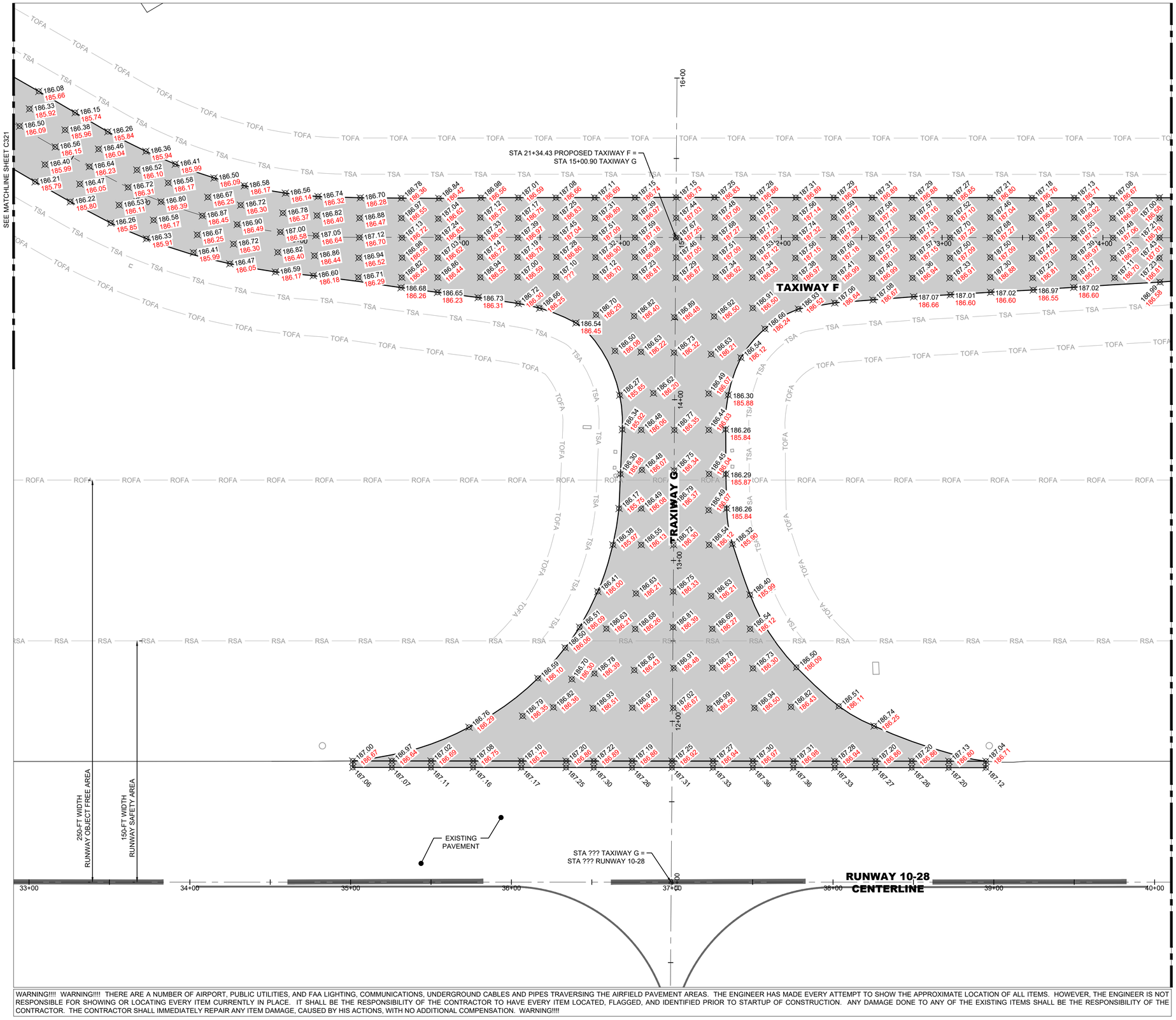

LEGEND

- P-401 ASPHALT OVERLAY
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — EXISTING AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- XXX.XX / XXX.XX — FINAL ELEVATION / MILLING ELEVATION
- XXX.XX / XXX.XX — FINAL ELEVATION / P-209 LAYER TOP ELEVATION

NOTES

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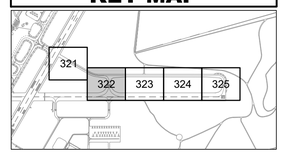
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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SHEET TITLE

FINAL ELEVATION PLAN (2 OF 5)

SHEET NUMBER

C322

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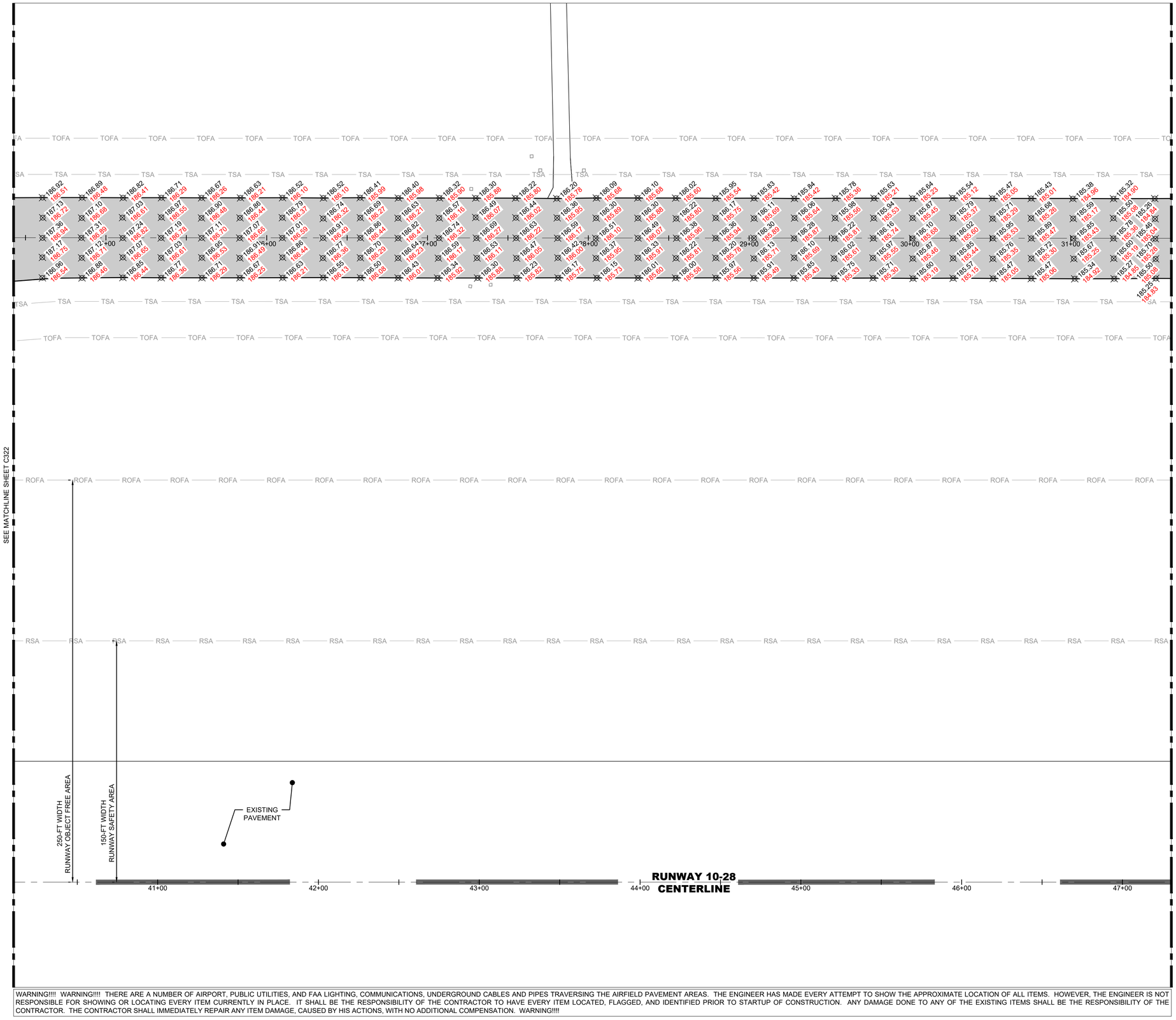

LEGEND

- P-401 ASPHALT OVERLAY
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — EXISTING AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- XXX.XX / XXX.XX — FINAL ELEVATION MILLING ELEVATION
- XXX.XX / XXX.XX — FINAL ELEVATION P-209 LAYER TOP ELEVATION

NOTES

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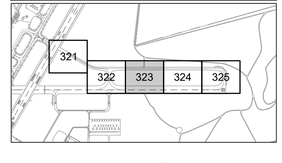
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

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SHEET TITLE

FINAL ELEVATION PLAN (3 OF 5)

SHEET NUMBER

C323

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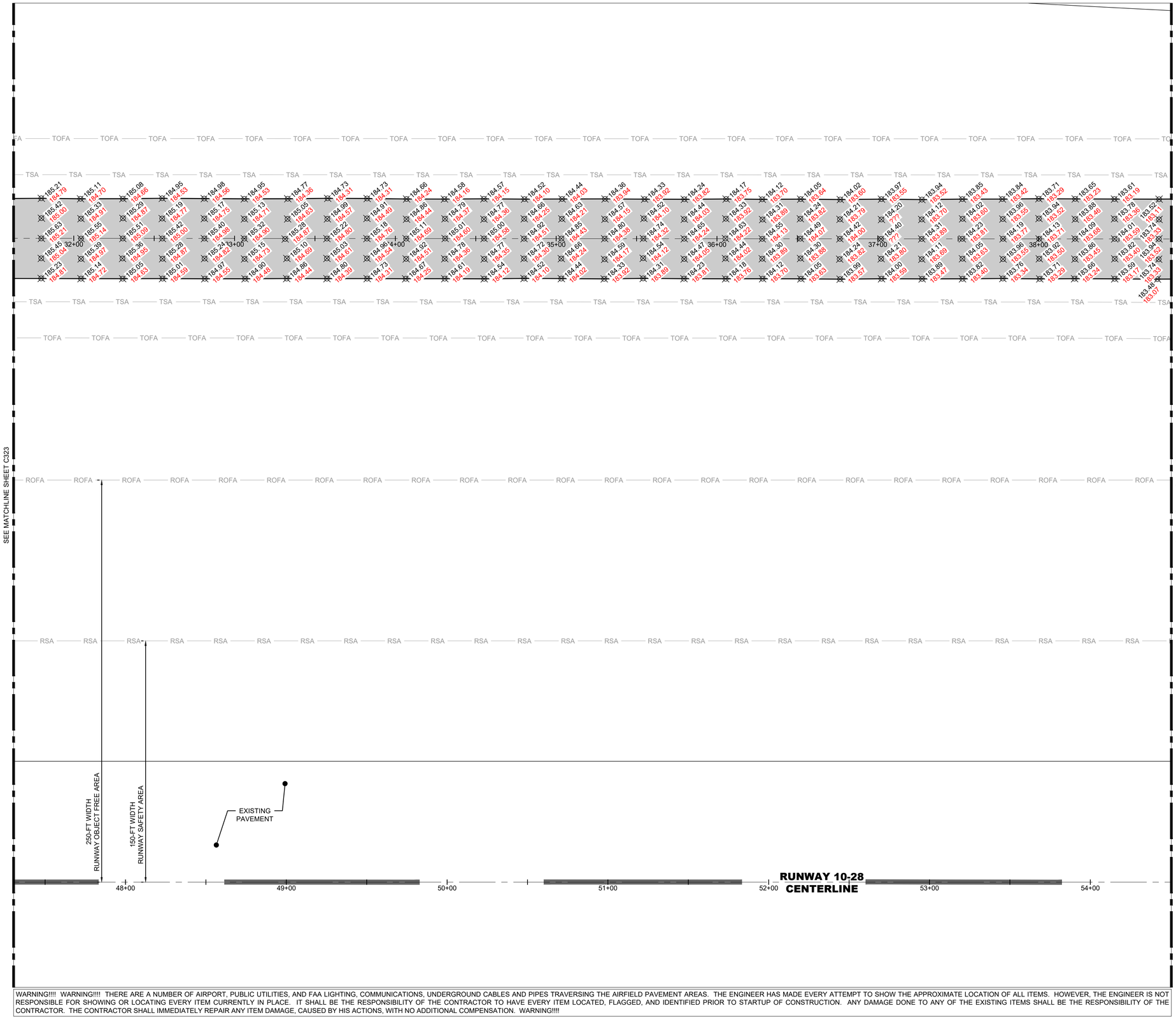

LEGEND

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- XXX.XX / XXX.XX — FINAL ELEVATION / MILLING ELEVATION
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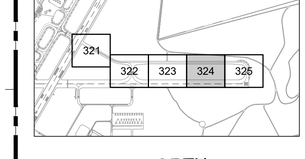
KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)

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REVIEWED BY:	AEB

SHEET TITLE

FINAL ELEVATION PLAN (4 OF 5)

SHEET NUMBER

C324

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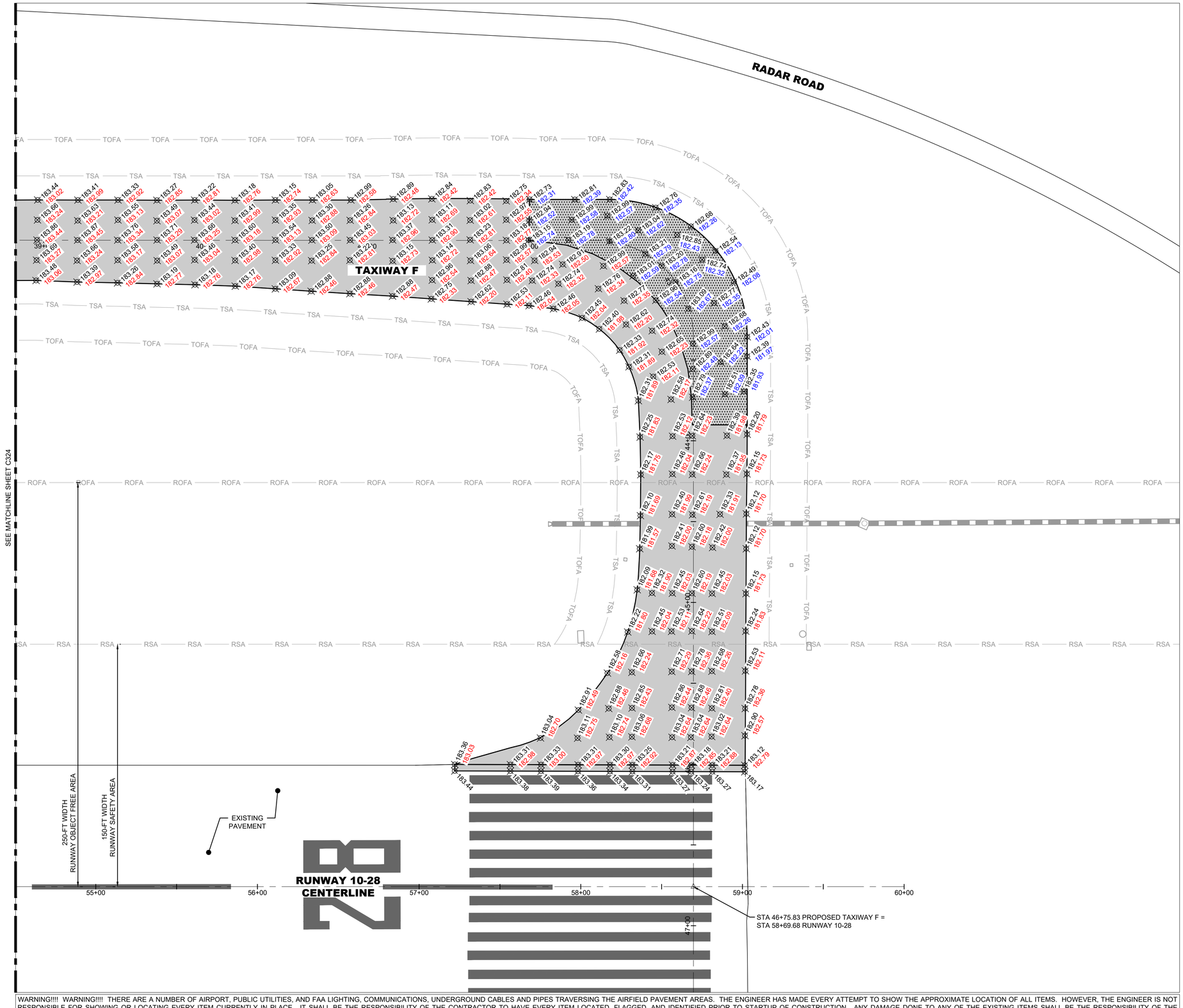

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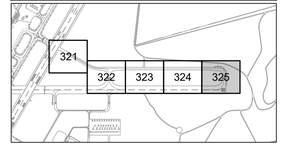
LEGEND

- P-401 ASPHALT OVERLAY
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- X — EXISTING AOA FENCE
- EXISTING MAJOR CONTOUR (1')
- EXISTING MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (0.5')
- PROPOSED MINOR CONTOUR (0.1')
- XXX.XX / XXX.XX — FINAL ELEVATION / MILLING ELEVATION
- XXX.XX / XXX.XX — FINAL ELEVATION / P-209 LAYER TOP ELEVATION

NOTES

1. THE FINAL ELEVATION PLAN PROVIDES ELEVATIONS SHOWING THE FINAL ASPHALT SURFACE LIFT COMPARED TO THE MILLING ELEVATION OR TOP OF P-209 ABC BASE ELEVATION. SEE LEGEND.
2. THE CONTRACTOR SHALL PROVIDE FINAL SURVEY DATA FOLLOWING FINAL LIFT COMPLETION FOR PAYMENT PER P-401 SPEC.
3. THE CONTRACTOR SHALL SUBMIT THE PROPOSED SURVEY GRID PATTERN TO VERIFY SPOT ELEVATIONS, FOR APPROVAL BY THE ENGINEER. IT MUST MATCH THE SURVEYED GRID PATTERN, EXCEPT AS NOTED BY THE RPR. THE TAXIWAY HAS AN OFF CENTER CROWN; THEREFORE SPOT ELEVATIONS ON THIS PLAN PROVIDE THE MOST ACCURATE CROWN POSITION.

KEY MAP



NORTH

30 0 30 60

SCALE (IN FEET)
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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TAXIWAY F AND G REHABILITATION PACKAGE

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SHEET TITLE

FINAL ELEVATION PLAN (5 OF 5)

SHEET NUMBER

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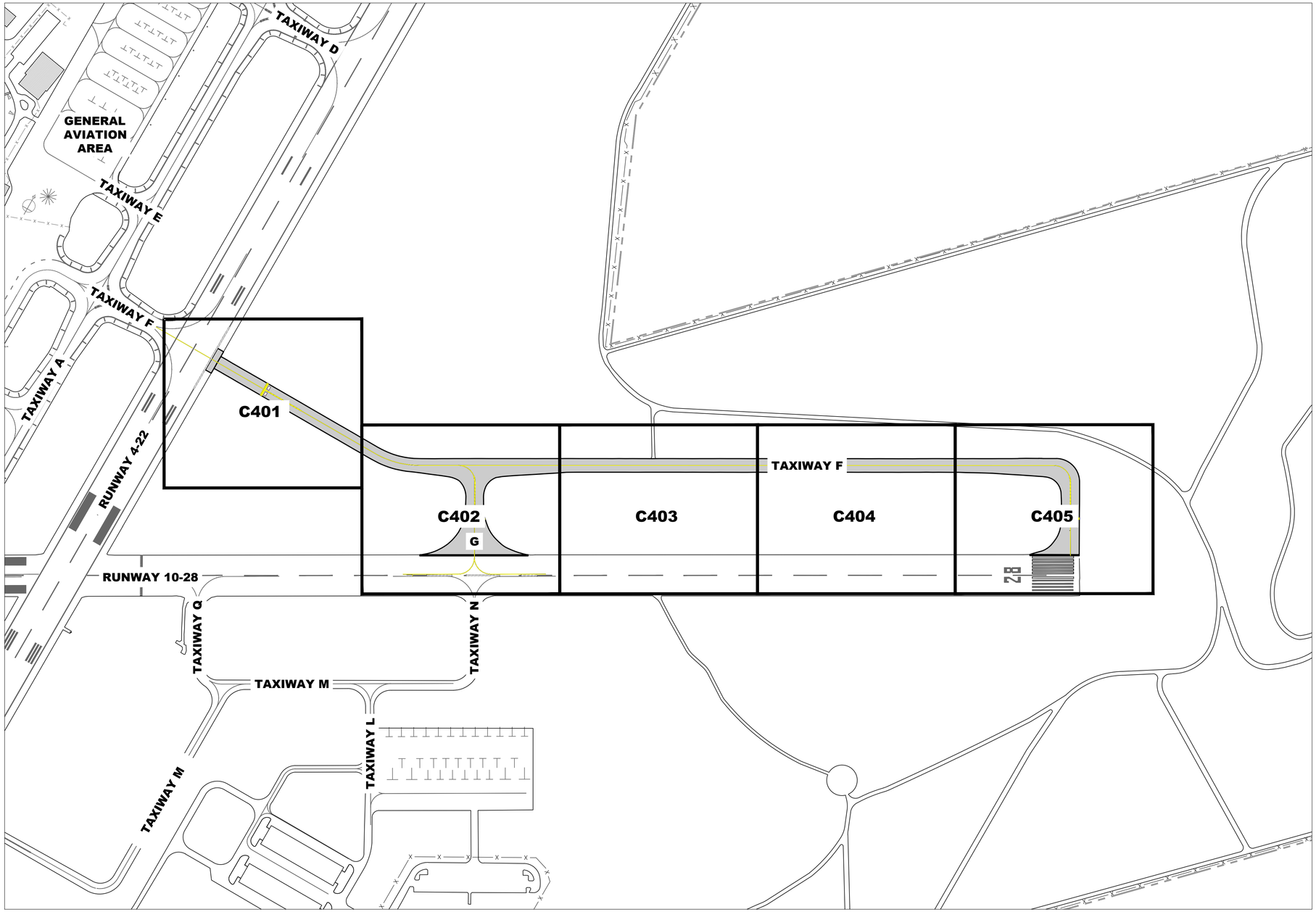

LEGEND

- P-401 ASPHALT OVERLAY
- TAXIWAY CENTERLINE MARKING
- AIRPORT PROPERTY LIMITS
- AOA FENCE

NORTH

200 0 200 400

SCALE (IN FEET)

1 INCH = 200 FEET (WHEN PRINTED 34"x22")

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SHEET TITLE

PAVEMENT MARKING KEY MAP

SHEET NUMBER

C400

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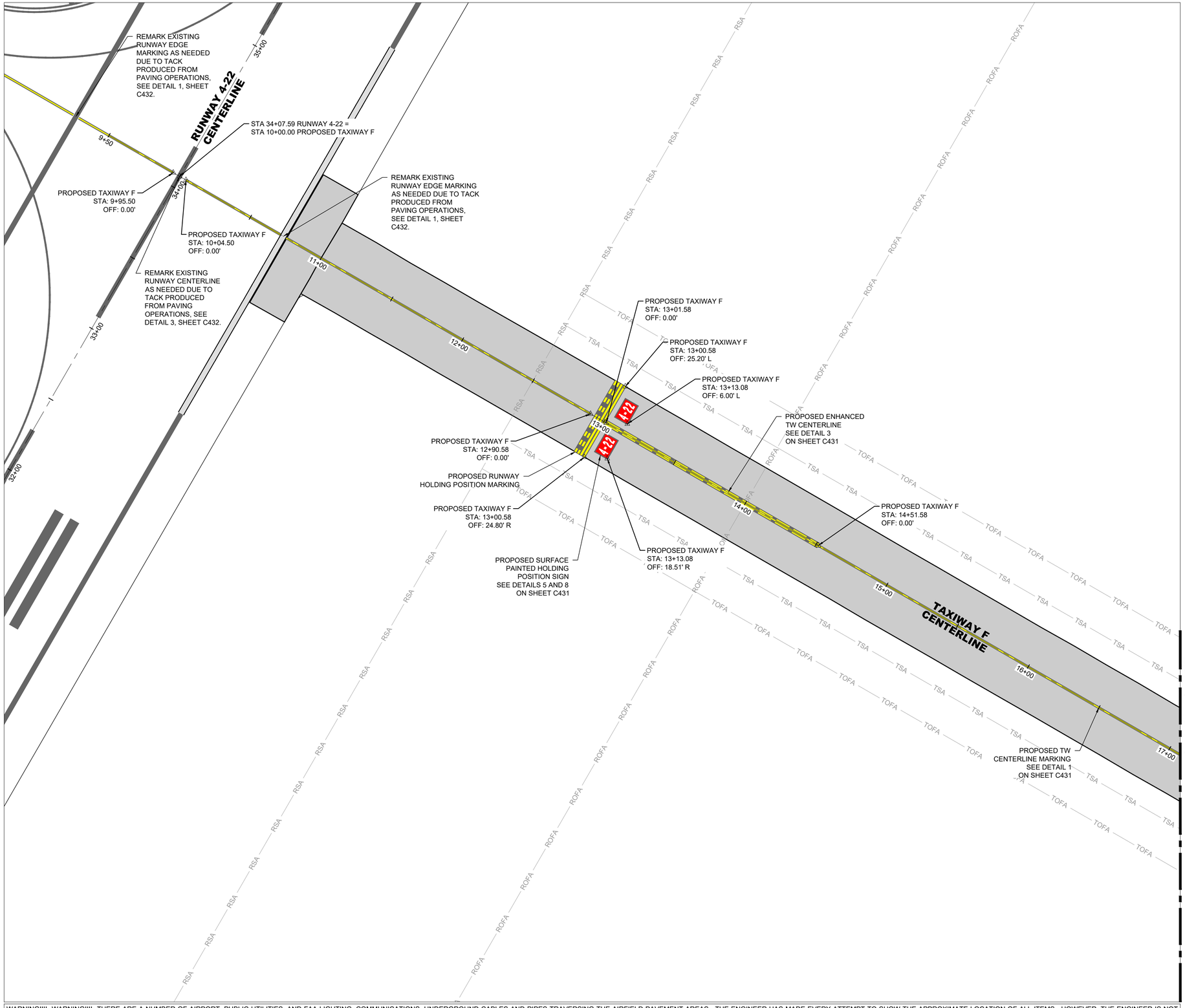

LEGEND

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- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
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2. SEE SHEET C431 FOR PAVEMENT MARKING DETAILS.
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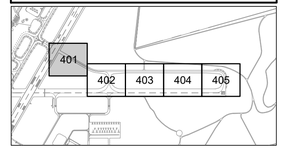

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30 0 30 60

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SHEET TITLE

PAVEMENT MARKING PLAN (1 OF 5)

SHEET NUMBER

C401

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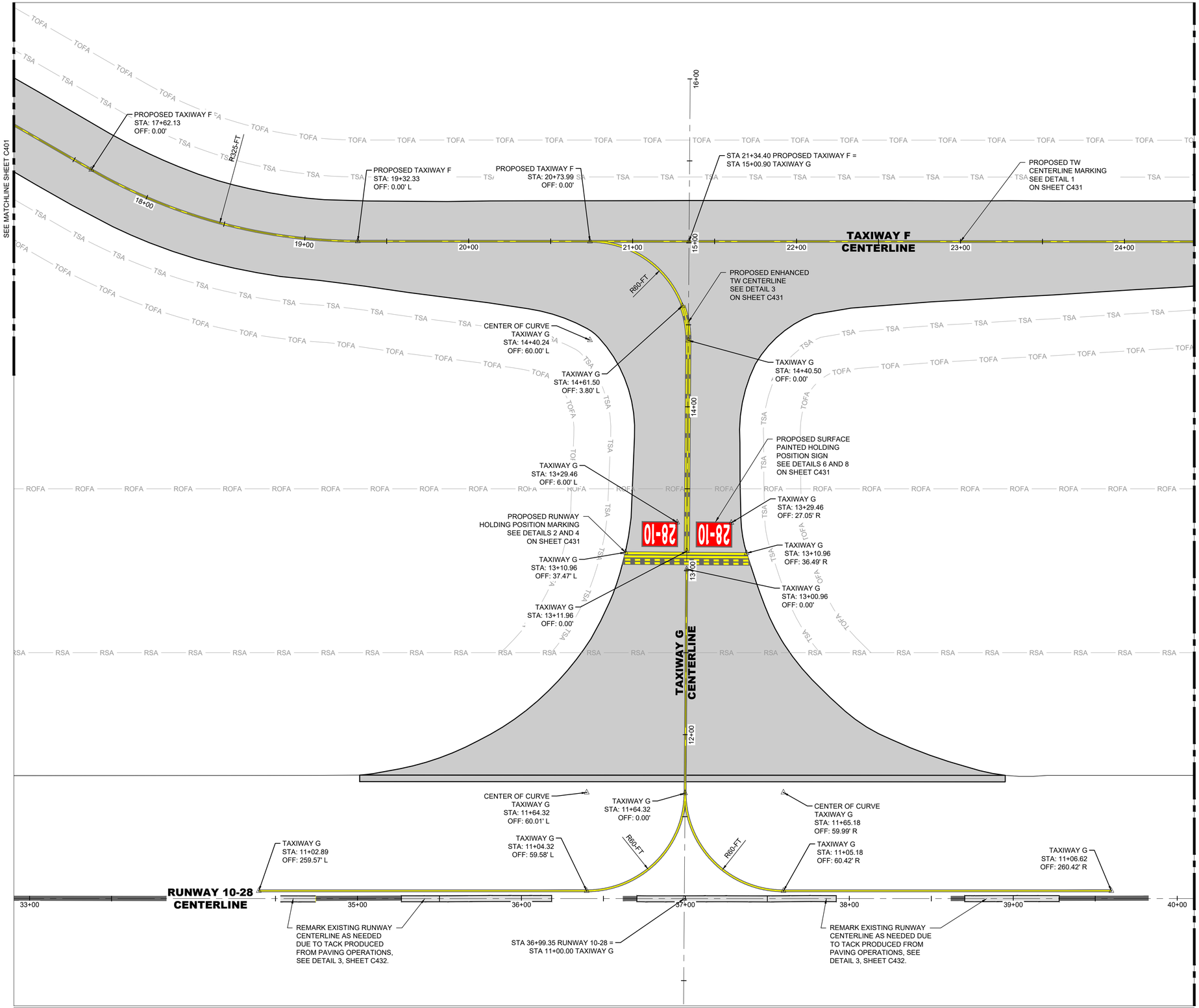

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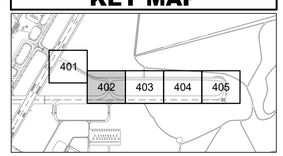

NORTH

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PAVEMENT MARKING PLAN (2 OF 5)

SHEET NUMBER

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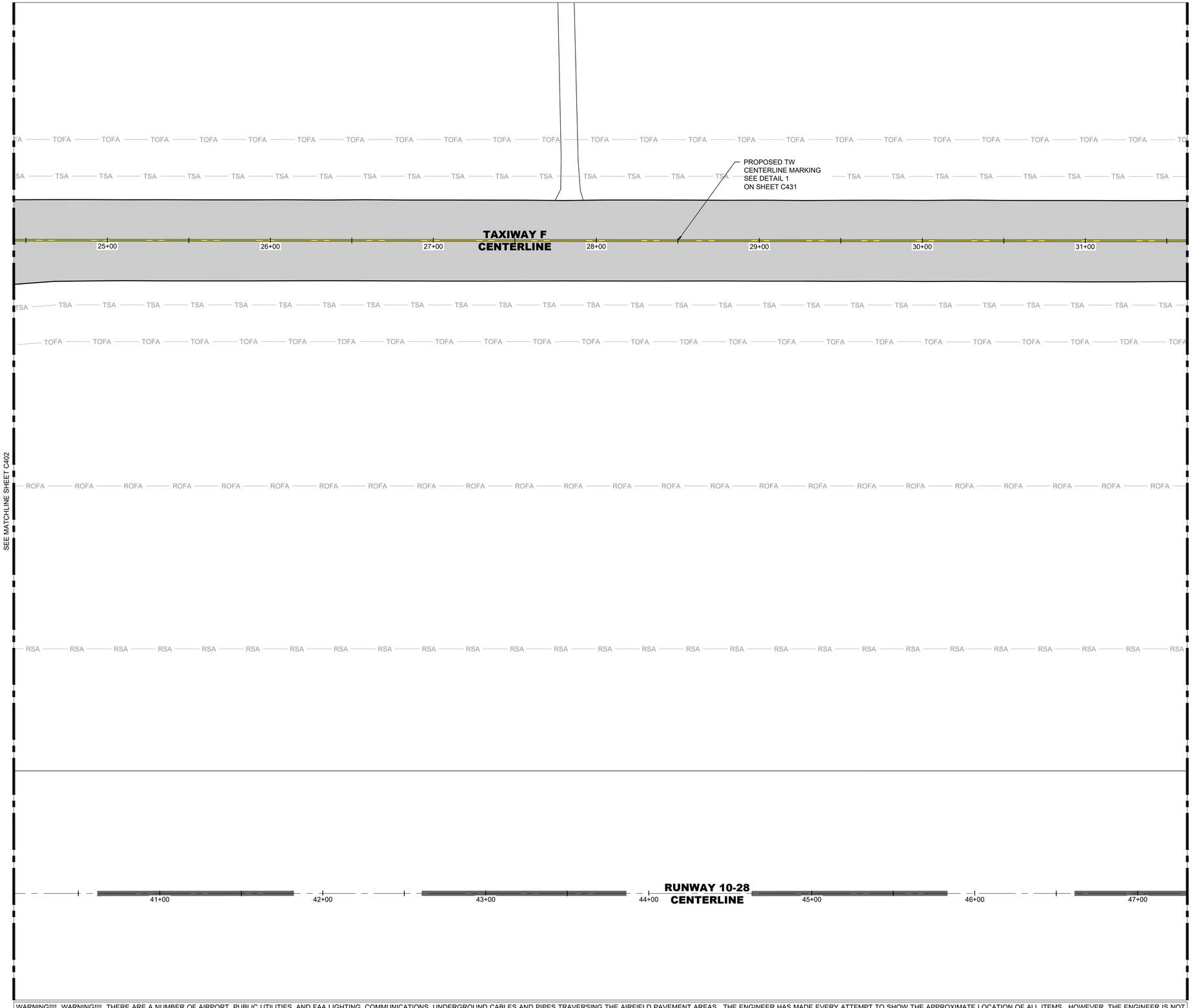

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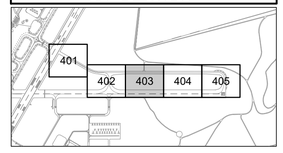

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PAVEMENT MARKING PLAN (3 OF 5)

SHEET NUMBER

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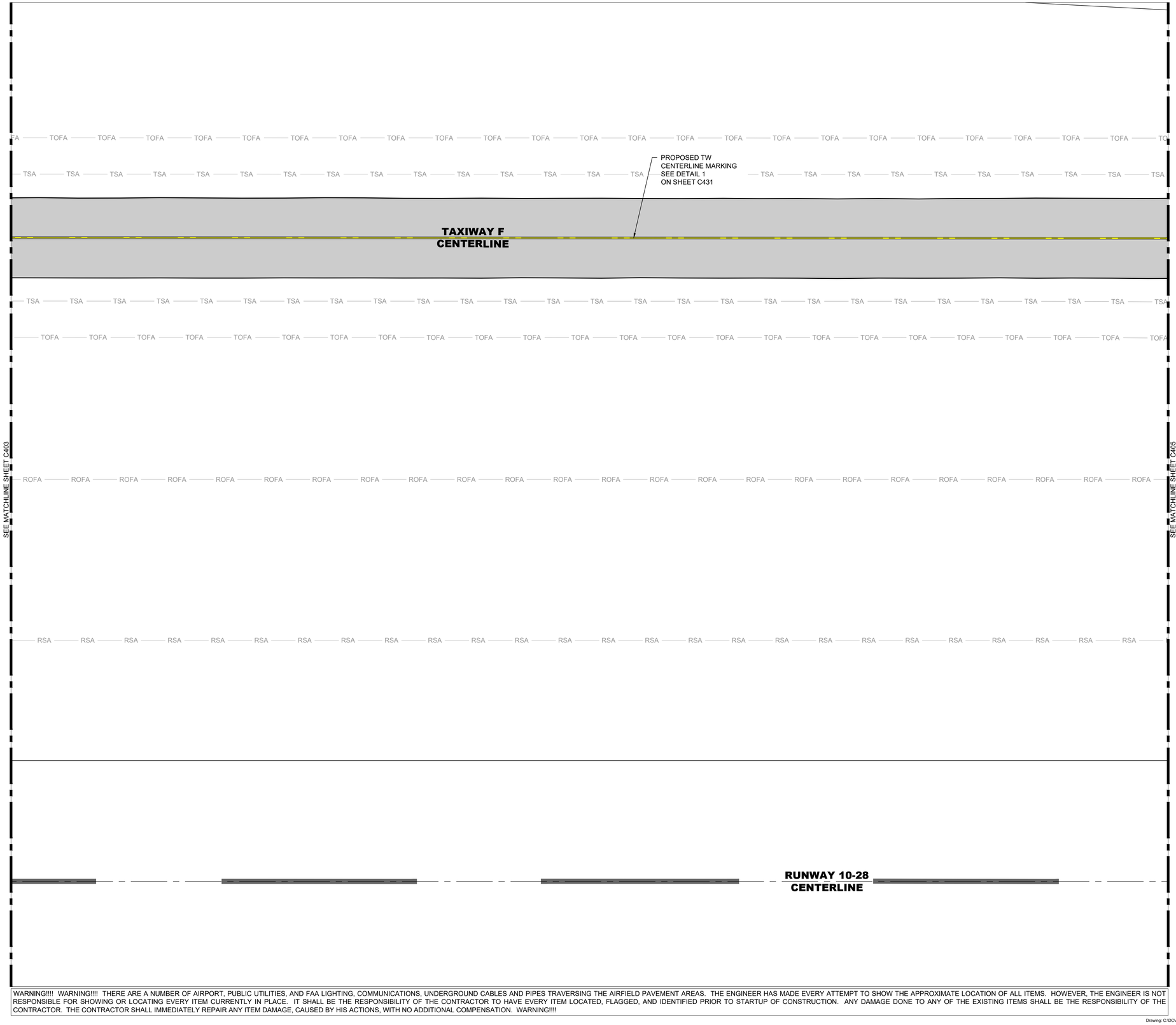

LEGEND

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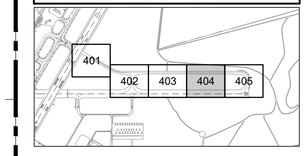

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PAVEMENT MARKING PLAN (4 OF 5)

SHEET NUMBER

C404

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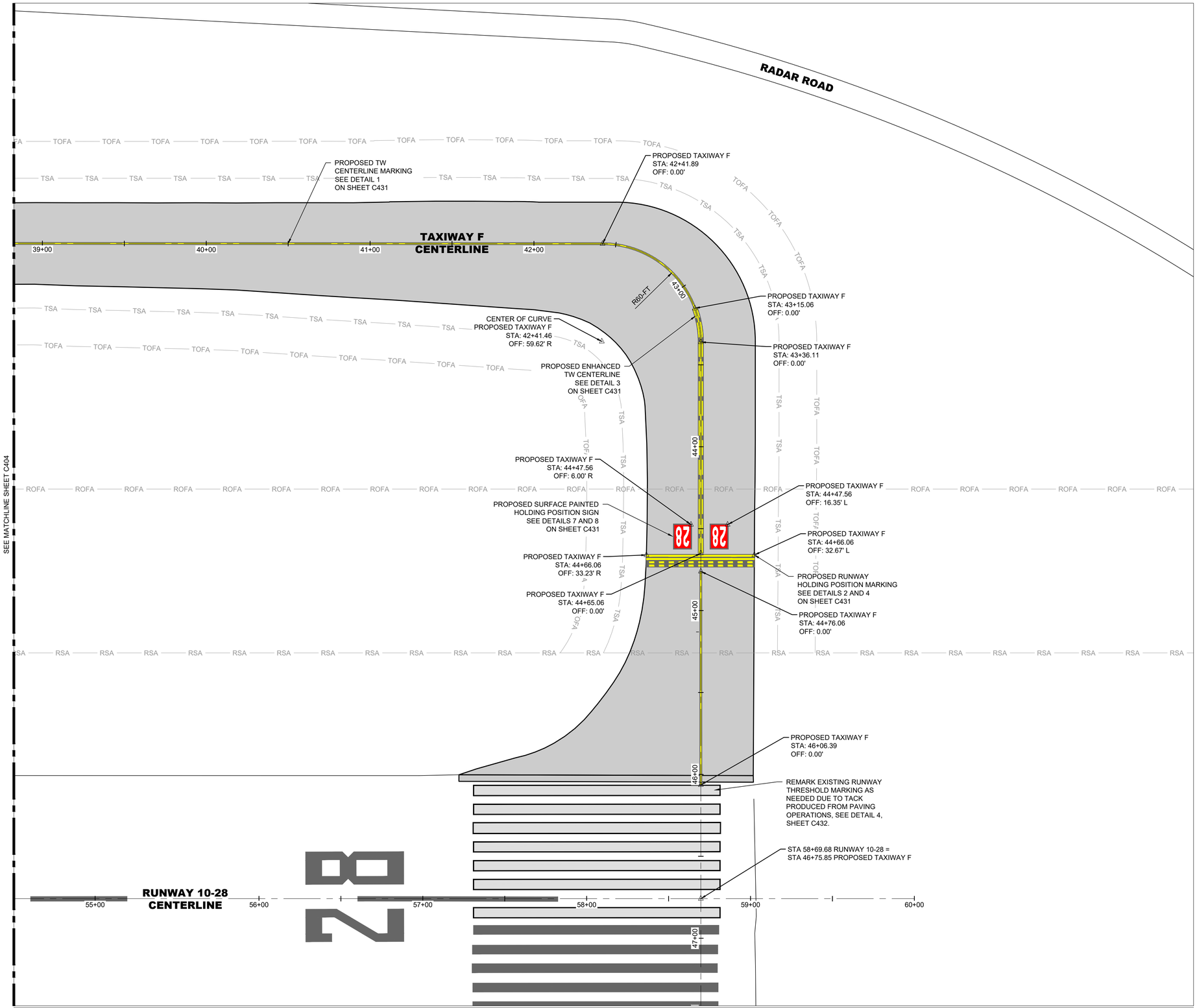

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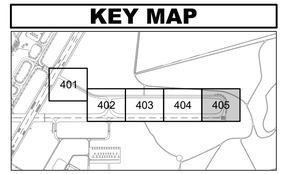

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PAVEMENT MARKING PLAN (5 OF 5)

SHEET NUMBER

C405

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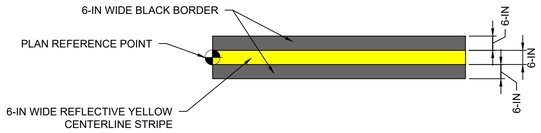
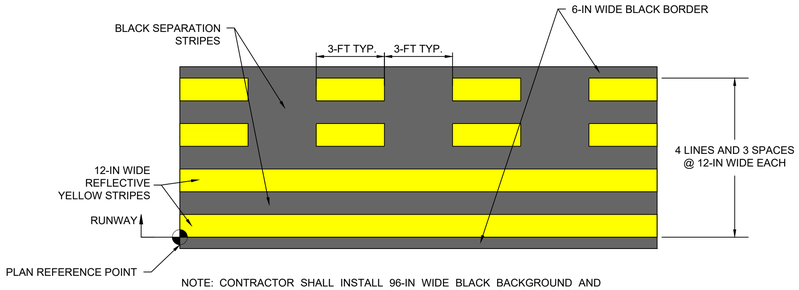


NOTE: CONTRACTOR SHALL INSTALL 18-IN WIDE BLACK BACKGROUND AND SHALL THEN INSTALL THE 6-IN WIDE YELLOW STRIPES AS INDICATED. CENTERLINE MARKINGS SHALL BE INTERRUPTED BY RUNWAY HOLDING POSITION MARKINGS, SEE DETAIL 4 ON THIS SHEET.

1 TAXIWAY CENTERLINE MARKING

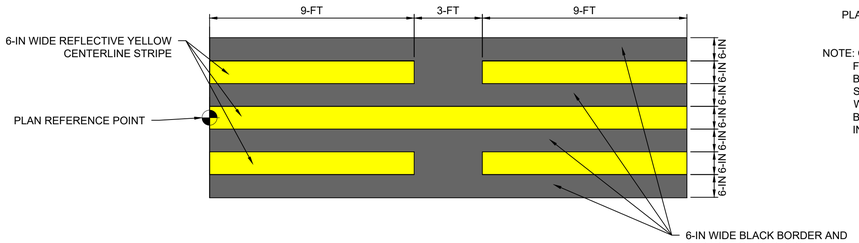
SCALE: NTS



NOTE: CONTRACTOR SHALL INSTALL 96-IN WIDE BLACK BACKGROUND AND SHALL THEN INSTALL THE 12-IN WIDE YELLOW STRIPES AS INDICATED.

2 RUNWAY HOLDING POSITION MARKING

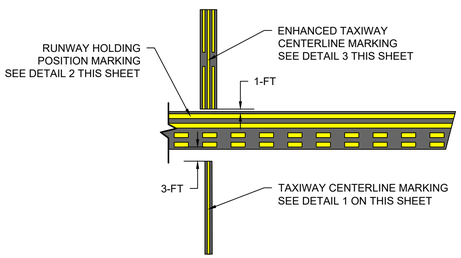
SCALE: NTS



NOTE: CONTRACTOR SHALL INSTALL 42-IN WIDE BLACK BACKGROUND AND SHALL THEN INSTALL THE 6-IN WIDE YELLOW STRIPES AS INDICATED. ENHANCED CENTERLINE MARKINGS SHALL BE INTERRUPTED BY RUNWAY HOLDING POSITION MARKINGS, SEE DETAIL 2 ON THIS SHEET.

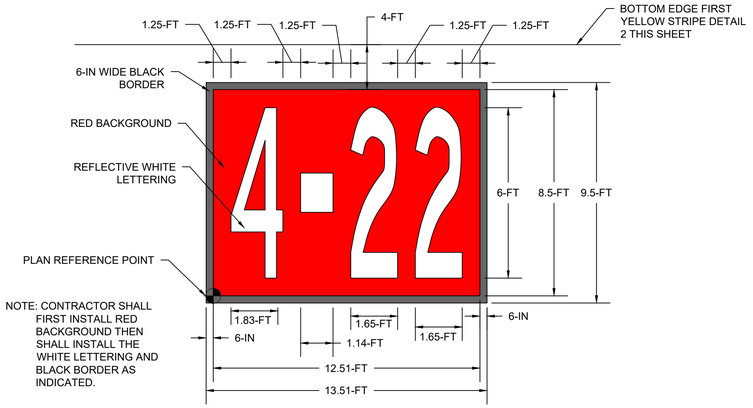
3 ENHANCED TAXIWAY CENTERLINE MARKING

SCALE: NTS



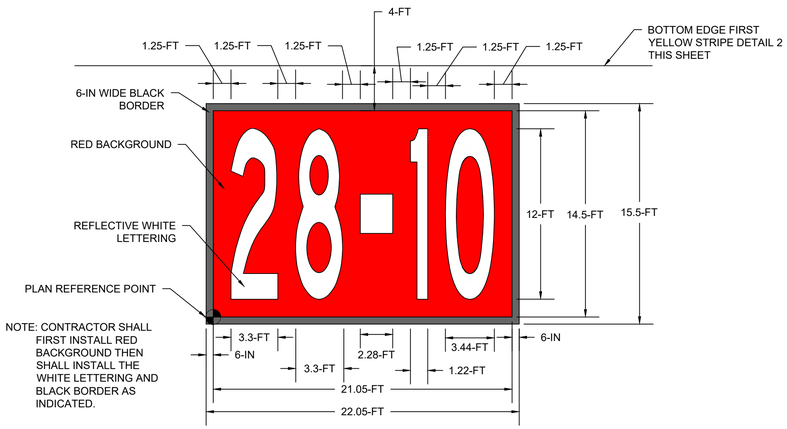
4 RUNWAY HOLDING POSITION MARKING SEPARATIONS

SCALE: NTS



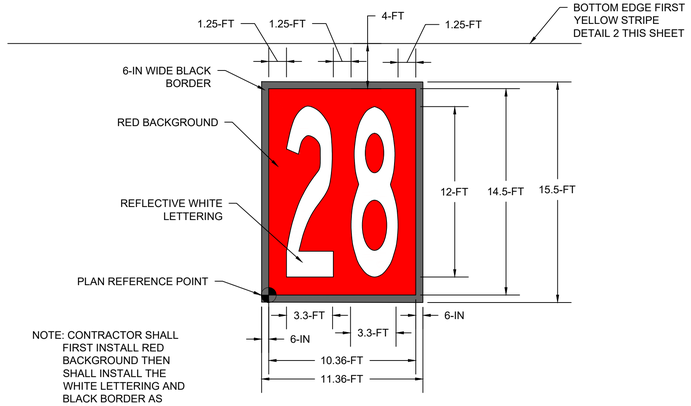
5 4-22 SURFACE PAINTED HOLDING POSITION SIGN

SCALE: NTS



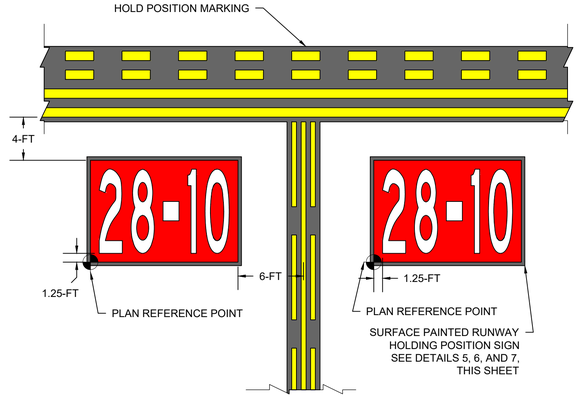
6 28-10 SURFACE PAINTED HOLDING POSITION SIGN

SCALE: NTS



7 28 SURFACE PAINTED HOLDING POSITION SIGN

SCALE: NTS



8 SURFACE PAINTED HOLD POSITION SIGNS

SCALE: NTS

NOTES

1. CONTRACTOR IS TO INSTALL TEMPORARY MARKINGS PER P-620 SPECIFICATION PRIOR TO 30 DAY ASPHALT CURE PERIOD. TEMPORARY MARKINGS ARE TO BE INSTALLED PRIOR TO ANY AREA REOPENING FOR AIRPORT OPERATIONS. TEMPORARY MARKING SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT.
2. INSCRIPTIONS FOR SIGNS AS PER AC 150/5340-1M, FIGURE B-1.

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

PAVEMENT MARKING DETAILS (1 OF 2)

SHEET NUMBER

C431

BIDDING DOCUMENTS

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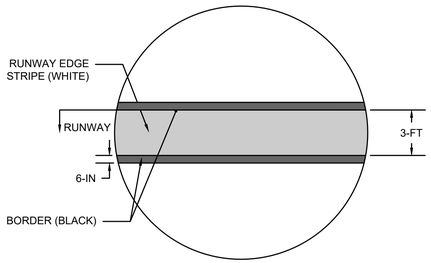
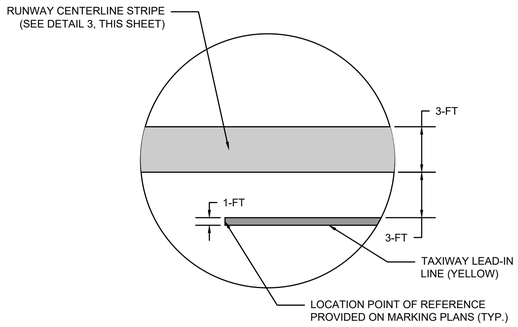
Drawing: C:\DC\ACCDocs\RS&H\10031830005_FAY Rehab of TW F and G\Project Files\CIC431_MARKING DETAILS.dwg Plotted on: 4/1/2026 5:41 PM Plotted by: Odom, Stephen



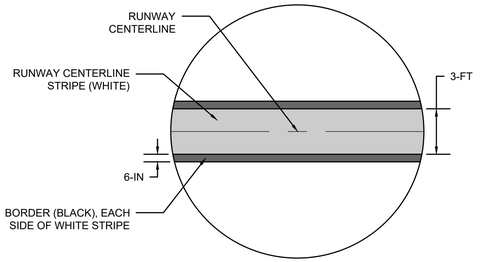
1 RUNWAY EDGE MARKING

NTS



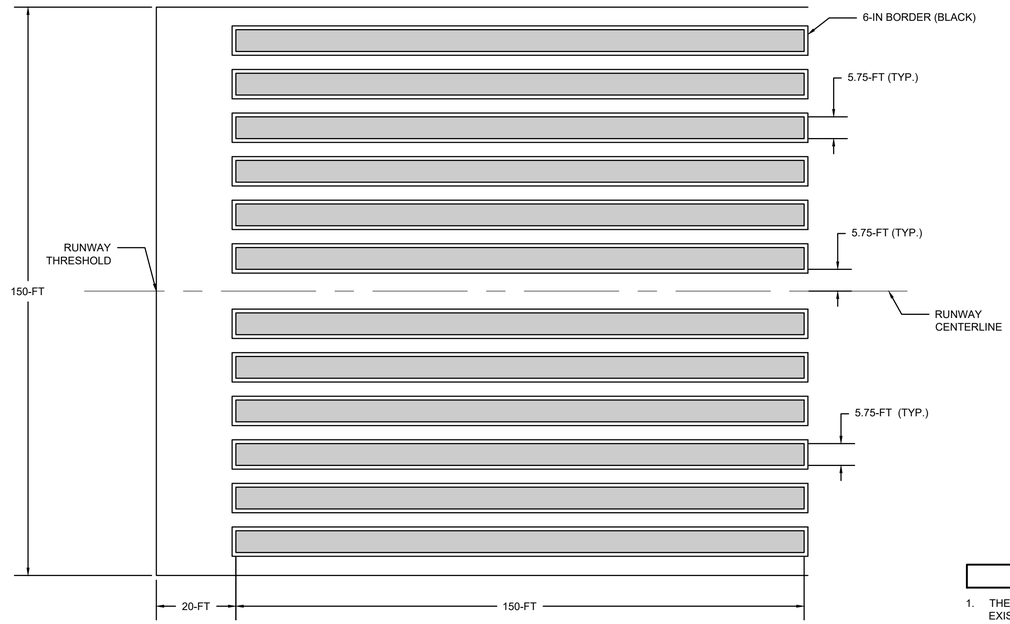
2 RUNWAY AND TAXIWAY CENTERLINE TIE-IN

NTS



3 RUNWAY CENTERLINE MARKING

NTS



4 RUNWAY THRESHOLD MARKING

NTS

NOTES

1. THESE DETAILS ARE INCLUDED TO FIX EXISTING RUNWAY MARKINGS THAT ARE COVERED UP BY RESIDUAL TACK PRODUCED DURING THE PAVING PROCESS.

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

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DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

PAVEMENT MARKING DETAILS (2 OF 2)

SHEET NUMBER

C432

BIDDING DOCUMENTS

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GENERAL EROSION AND SEDIMENTATION CONTROL NOTES

1. THE PURPOSE OF EROSION AND SEDIMENTATION CONTROL IS TO PREVENT POLLUTION OF BODIES OF WATER ON OR ADJACENT TO THE PROJECT SITE.

2. ALL EROSION AND SILTATION MEASURES ARE TO BE PLACED PRIOR TO ANY DEMOLITION OR EARTHWORK. THE EROSION CONTROL SYMBOLOGY SHOWN ON PLAN SHEETS SHALL BE UTILIZED IN THE DEFINITION AND UTILIZATION OF ALL EROSION AND SILTATION MEASURES.

3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSPECT ALL EROSION CONTROL DEVICES PERIODICALLY AND AFTER EVERY RAINFALL. ANY NECESSARY REPAIRS TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES OR CLEANUP SHALL BE MADE IMMEDIATELY.

4. DURING CONSTRUCTION, ALL STORM DRAIN INLETS WILL BE PROTECTED, MAINTAINED AND MODIFIED AS REQUIRED BY CONSTRUCTION PROGRESS. REFER TO THE TYPICAL DRAINAGE INLET SEDIMENTATION CONTROL DEVICE DETAILS SHEET C532.

5. ALL CONSTRUCTION DISCHARGE WATER SHALL BE ADEQUATELY FILTERED TO REMOVE SILT PRIOR TO DISCHARGE INTO WATERWAYS AND WETLANDS.

6. THERE ARE NO STREAM CROSSINGS FOR THIS PROJECT. ALL STREAM CROSSINGS AND STREAM DIVERSIONS REQUIRE ENVIRONMENTAL APPROVAL PRIOR TO ANY INSTREAM CONSTRUCTION.

7. THE CONTRACTOR SHALL MAINTAIN STRICT DUST CONTROL DURING THE PROJECT DURATION. THERE ARE OPERATIONAL AREAS, AIRCRAFT PARKED ON THE AIRPORT, COMMERCIAL FACILITIES WHICH PERFORM MAINTENANCE AND REPAIR WORK TO AIRCRAFT. THEREFORE, IT IS IMPERATIVE THAT STRICT DUST CONTROL BE MAINTAINED SO THAT DAMAGE OR NUISANCE TO THE AREAS AND FACILITIES DESCRIBED ABOVE OR AIRPORT OPERATIONAL AREAS IS PREVENTED. THIS DUST CONTROL SHALL ALSO INCLUDE THE DUST WHICH MAY OCCUR DURING ANY CONSTRUCTION PROCEDURE. IF DUST CONTROL IS NOT MAINTAINED TO THE SATISFACTION OF THE CPM, THE CONTRACTOR SHALL RECEIVE ONE WARNING. IF FURTHER VIOLATIONS OF THE DUST CONTROL OCCUR, THE CONTRACTOR SHALL BE FINED $1,000.00 FOR EACH INDIVIDUAL INFRACTION IDENTIFIED BY THE CPM. THE CPM SHALL BE THE SOLE INTERPRETERS OF WHETHER THE DUST IS EXCESSIVE AND WHETHER OR NOT FINES WILL BE LEVIED AGAINST THE CONTRACTOR.

8. EROSION AND SEDIMENTATION CONTROL MEASURES SHOWN AS FINAL MUST REMAIN INPLACE UNTIL THE SITE HAS BEEN ESTABLISHED AND THE TAXIWAY HAS BEEN APPROVED FOR REOPENING.

9. EXPOSED SOIL IS TO BE STABILIZED WITHIN THE FOLLOWING TIMES:
   -SLOPES STEEPER THAN 3:1 7 DAYS
   -SLOPES 3:1 OR FLATTER 14 DAYS
   -ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1 - 14 DAYS

SILT FENCE NOTES

1. SILT FENCE SHALL BE IN PLACE PRIOR TO MOBILIZATION TO THE CONTRACTOR STAGING AREAS. SILT FENCE SHALL BE USED ONLY IN THE CONTRACTOR STAGING AREAS AND PLACED AROUND ANY STOCKPILED MATERIALS.

2. SILT FENCE AND FILTER FABRIC MUST BE ENTRENCHED.

3. POSTS FOR SILT FENCES SHALL BE EITHER 2.5 X 2 INCH DIAMETER WOOD OR 1.25 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE TO THEM.

4. WIRE FENCE REINFORCEMENT FOR SILT FENCES USING STANDARD STRENGTH FILTER CLOTH SHALL BE A MINIMUM OF 42 INCHES IN HEIGHT, A MINIMUM OF 14 GAUGE AND SHALL HAVE A MAXIMUM MESH SPACING OF 6 INCHES.

5. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MIN. OF 24 INCHES) WHEN EXTRA STRENGTH FABRIC IS USED. WITHOUT THE WIRE SUPPORT FENCE, POSTS SHALL NOT EXCEED 6 FEET.

6. WHEN EXTRA STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POST.

7. SEDIMENT MUST BE REMOVED AND PROPERLY DISPOSED OF WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD OF THE VOLUME CAPACITY.

8. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE PROPOSED AND EXISTING GRADES, PREPARED AND SEEDED OR SODDED.

9. UNDER NO CIRCUMSTANCES SHALL SILT FENCE BE CONSTRUCTED IN LIVE STREAMS.

10. SILT FENCE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT OR AT A TIME DIRECTED BY THE RPR. IF THE OWNER FEELS IT IS NECESSARY FOR THE SILT FENCE TO REMAIN IN PLACE FOR SOME GIVEN TIME AFTER CONSTRUCTION IS COMPLETE, THE CONTRACTOR SHALL LEAVE IT IN PLACE, IN THE PROPERLY INSTALLED WAY, AND WILL, AT THE DIRECTION OF THE RPR, REMOVE IT AT NO ADDITIONAL COST TO THE OWNER WHEN THE OWNER DEEMS IT APPROPRIATE.

SODDING NOTES

1. CONTRACTOR SHALL REFER TO PROJECT TECHNICAL SPECIFICATION T-904 FOR ALL SODDING REQUIREMENTS.

2. SOD FURNISHED BY THE CONTRACTOR SHALL HAVE A GOOD COVER OF LIVING OR GROWING GRASS. THIS SHALL BE INTERPRETED TO INCLUDED GRASS THAT IS SEASONALLY DORMANT DURING THE COLD OR DRY SEASONS AND CAPABLE OF RENEWING GROWTH AFTER THE DORMANT PERIOD. ALL SOD SHALL BE OBTAINED FROM AREAS WHERE THE SOIL IS REASONABLY FERTILE AND CONTAINS A HIGH PERCENTAGE OF LOAMY TOPSOIL. SOD SHALL BE CUT OR STRIPPED FROM LIVING, THICKLY MATTED TURF RELATIVELY FREE OF WEEDS OR OTHER UNDESIRABLE FOREIGN PLANTS, LARGE STONES, ROOTS, OR OTHER MATERIALS THAT MIGHT BE DETRIMENTAL TO THE DEVELOPMENT OF THE SOD OR TO FUTURE MAINTENANCE. AT LEAST 70% OF THE PLANTS IN THE CUT SOD SHALL BE COMPOSED OF THE SPECIES STATE IN THE SPECIAL PROVISIONS, AND ANY VEGETATION MORE THAN 6" IN HEIGHT SHALL BE MOWED TO A HEIGHT OF 3" OR LESS BEFORE SOD IS LIFTED. SOD, INCLUDING THE SOIL CONTAINING THE ROOTS AND THE PLANT GROWTH SHOWING ABOVE, SHALL BE CUT UNIFORMLY TOA THICKNESS NOT LESS THAT STATE HEREIN.

3. ABSOLUTELY NO MILLET GRASS WILL BE ALLOWED IN THE SOD. ANY MILLET GRASS FOUND IN THE SODDED AREAS SHALL BE PENALIZED. SEE TECHNICAL SPECIFICATION FOR PENALTIES.

4. THE CONTRACTOR SHALL PLACE THE WIDTH OF SOD AS DEFINED IN THE PLANS.

5. 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 SEIVE. COARSER MATERIAL WILL BE ACCEPTABLE, PROVIDING THE RATES OF APPLICATION ARE INCREASED TO PROVIDE NOT LESS THAT THE MINIMUM QUANTITIES AND DEPTH SPECIFIED IN THE SPECIAL PROVISIONS ON THE BASIS OF THE TWO SEIVE 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 150 POUNDS PER 1,000 SQUARE FEET. ALL LIMING MATERIALS SHALL CONFORM TO THE REQURIEMENTS OF ASTM C 602.

6. 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 HEREIN, AND SHALL MEET THE REQUIREMENTS OF FEDERAL SPEC. A-A-1909 AND 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 DRY, FREE-FLOWING FERTILIZER SUITABLE FOR THE APPLICATION BY A COMMON FERTILIZER SPREADER
   -A FINELY-GROUND FERTILIZER SOLUBLE IN WATER, SUITABLE FOR APPLICATION BY POWER SPRAYERS
   -A GRANULAR OR PELLET FORM SUITABLE FOR APPLICATION BY BLOWER EQUIPMENT

   FERTILIZERS SHALL BE 10-10-10 COMMERCIAL FERTILIZER AND SPREAD AT THE RATE OF 15 POUNDS PER 1,000 SQUARE FEET AS A MINIMUM OR TYPE AND RATE AS RECOMMENDED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE LOCAL EXTENSION OFFICE TO ACHIEVE THE BEST RESULTS FOR THE TIME OF YEAR, PLACEMENT GEOGRAPHY, AND IRRIGATION CONDITIONS.

7. THE WATER SHALL BE SUFFICIENTLY FREE FROM OIL, ACID, ALKALI, SALT, OR OTHER HARMFUL MATERIALS THAT WOULD INHIBIT THE GROWTH OF GRASS. IT SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER PRIOR TO USE.

8. AREAS TO BE SOLID, STRIP, OR SPOT SODDED SHALL BE SHOWN ON THE PLANS. AREAS REQUIRING SPECIAL GROUND SURFACE PREPARATION SUCH AS TILLING AND THOSE AREAS IN A SATISFACTORY CONDITION THAT ARE TO REMAIN UNDISTURBED SHALL ALSO BE SHOWN ON THE PLANS. SUITABLE EQUIPMENT NECESSARY FOR PROPER PREPARATION OF THE GROUND SURFACE AND FOR THE HANDLING AND PLACING OF ALL REQUIRED MATERIALS SHALL BE ON HAND, IN GOOD CONDITION, AND SHALL BE APPROVED BY THE ENGINEER BEFORE THE VARIOUS OPERATIONS ARE STARTED. THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER BEFORE STARTING THE VARIOUS OPERATIONS THAT THE APPLICATION OF REQUIRED MATERIALS WILL BE MADE AT THE SPECIFIED RATES.

9. AFTER GRADING OF AREAS HAS BEEN COMPLETED AND BEFORE APPLYING FERTILIZER AND LIMESTONE, AREAS TO BE SODDED SHALL BE RAKED OR OTHERWISE CLEARED OF STONES LARGER THAN 2 IN (50 MM) IN ANY DIAMETER, STICKS, STUMPS, AND OTHER DEBRIS WHICH MIGHT INTERFERE WITH SODDING, GROWTH OF GRASSES, OR SUBSEQUENT MAINTENANCE OF GRASS-COVERED AREAS. IF ANY DAMAGE BY EROSION OR OTHER CAUSES OCCURS AFTER GRADING OF AREAS AND BEFORE BEGINNING THE APPLICATION OF FERTILIZER AND GROUND LIMESTONE, THE CONTRACTOR SHALL REPAIR SUCH DAMAGE. THIS MAY INCLUDE FILLING GULLIES, SMOOTHING IRREGULARITIES, AND REPAIRING OTHER INCIDENTAL DAMAGE.

10. FOLLOWING GROUND SURFACE PREPARATION, FERTILIZER SHALL BE UNIFORMLY SPREAD AT A RATE WHICH WILL PROVIDE NOT LESS THAN THE MINIMUM QUANTITY OF EACH FERTILIZER INGREDIENT, AS STATED IN THE SPECIAL PROVISIONS. IF USE OF GROUND LIMESTONE IS REQUIRED, IT SHALL THEN BE SPREAD AT A RATE THAT WILL PROVIDE NOT LESS THAN THE MINIMUM QUANTITY AS PREVIOUSLY STATED IN 904-2.2 AND 904-2.3. THE SPECIAL PROVISIONS T-901, SEEDING , SECTION 901-2.3, FERTILIZER. THESE MATERIALS SHALL BE INCORPORATED INTO THE SOIL TO A DEPTH OF NOT LESS THAN 2 IN (50 MM) BY DISCING, RAKING, OR OTHER METHODS ACCEPTABLE TO THE ENGINEER. ANY STONES LARGER THAN 2 IN (50 MM) IN ANY DIAMETER, LARGE CLODS, ROOTS, AND OTHER LITTER BROUGHT TO THE SURFACE BY THIS OPERATION SHALL BE REMOVED.

11. AFTER INSPECTION AND APPROVAL OF THE SOURCE OF SOD BY THE ENGINEER, THE SOD SHALL BE CUT WITH APPROVED SOD CUTTERS TO SUCH A THICKNESS THAT AFTER IT HAS BEEN TRANSPORTED AND PLACED ON THE PREPARED BED, BUT BEFORE IT HAS BEEN COMPACTED, IT SHALL HAVE A UNIFORM THICKNESS OF NOT LESS THAN 2 IN (50 MM). SOD SECTIONS OR STRIPS SHALL BE CUT IN UNIFORM WIDTHS, NOT LESS THAN 10 IN (250 MM), AND IN LENGTHS OF NOT LESS THAN 18 IN (45 CM), BUT OF SUCH LENGTH AS MAY BE READILY LIFTED WITHOUT BREAKING, TEARING, OR LOSS OF SOIL. WHERE STRIPS ARE REQUIRED, THE SOD MUST BE ROLLED WITHOUT DAMAGE WITH THE GRASS FOLDED INSIDE. THE CONTRACTOR MAY BE REQUIRED TO MOW HIGH GRASS BEFORE CUTTING SOD.THE SOD SHALL BE TRANSPLANTED WITHIN 24 HOURS FROM THE TIME IT IS STRIPPED, UNLESS CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL MAKE STORING NECESSARY. IN SUCH CASES, SOD SHALL BE STACKED, KEPT MOIST, AND PROTECTED FROM EXPOSURE TO THE AIR AND SUN AND SHALL BE KEPT FROM FREEZING. SOD SHALL BE CUT AND MOVED ONLY WHEN THE SOIL MOISTURE CONDITIONS ARE SUCH THAT FAVORABLE RESULTS CAN BE EXPECTED. WHERE THE SOIL IS TOO DRY, PERMISSION TO CUT SOD MAY BE GRANTED ONLY AFTER IT HAS BEEN WATERED SUFFICIENTLY TO MOISTEN THE SOIL TO THE DEPTH THE SOD IS TO BE CUT. THE CONTRACTOR SHALL, FOR EACH LOAD OF SOD, SUBMIT A WRITTEN CERTIFICATION FROM THE SOD SOURCE CERTIFYING THE SOD SOURCES ARE FREE OF TROPICAL SODA APPLE SEED SOURCE AND PLANTS AS WELL AS MILLET SEED. ANY TROPICAL SODA APPLE PLANTS OR MILLET SEED THAT PROPAGATE IN THE AREAS OF NEW SOD SHALL BE CONTROLLED BY THE CONTRACTOR, AT THE CONTRACTOR'S SOLE COST WITHOUT COMPENSATION, UNTIL ALL TROPICAL SODA APPLE PLANTS AND/OR MILLET GRASS HAVE BEEN ERADICATED IN THE AFFECTED AREAS. THE TIME FRAME FOR ERADICATION OR EMERGENCE OF PLANT SPECIMENS SHALL BE THE FULL AND COMPLETE WARRANTY PERIOD OR AS DIRECTED BY THE OWNER.

12. SODDING SHALL BE PERFORMED ONLY DURING THE SEASONS WHEN SATISFACTORY RESULTS CAN BE EXPECTED. FROZEN SOD SHALL NOT BE USED AND SOD SHALL NOT BE PLACED UPON FROZEN SOIL. SOD MAY BE TRANSPLANTED DURING PERIODS OF DROUGHT WITH THE APPROVAL OF THE ENGINEER, PROVIDED THE SOD BED IS WATERED TO MOISTEN THE SOIL TO A DEPTH OF AT LEAST 4 IN (100 MM) IMMEDIATELY PRIOR TO LAYING THE SOD.

13. THE SOD SHALL BE MOIST AND SHALL BE PLACED ON A MOIST EARTH BED. PITCH FORKS SHALL NOT BE USED TO HANDLE SOD, AND DUMPING FROM VEHICLES SHALL NOT BE PERMITTED. THE SOD SHALL BE CAREFULLY PLACED BY HAND, EDGE TO EDGE AND WITH STAGGERED JOINTS, IN ROWS AT RIGHT ANGLES TO THE SLOPES, COMMENCING AT THE BASE OF THE AREA TO BE SODDED AND WORKING UPWARD. THE SOD SHALL IMMEDIATELY BE PRESSED FIRMLY INTO CONTACT WITH THE SOD BED BY TAMPING OR ROLLING WITH APPROVED EQUIPMENT TO PROVIDE A TRUE AND EVEN SURFACE, AND INSURE KNITTING WITHOUT DISPLACEMENT OF THE SOD OR DEFORMATION OF THE SURFACES OF SODDED AREAS. WHERE THE SOD MAY BE DISPLACED DURING SODDING OPERATIONS, THE WORKMEN WHEN REPLACING IT SHALL WORK FROM LADDERS OR TREADED PLANKS TO PREVENT FURTHER DISPLACEMENT. SCREENED SOIL OF GOOD QUALITY SHALL BE USED TO FILL ALL CRACKS BETWEEN SODS. THE QUANTITY OF THE FILL SOIL SHALL NOT CAUSE SMOTHERING OF THE GRASS. WHERE THE GRADES ARE SUCH THAT THE FLOW OF WATER WILL BE FROM PAVED SURFACES ACROSS SODDED AREAS, THE SURFACE OF THE SOIL IN THE SOD AFTER COMPACTION SHALL BE SET APPROXIMATELY 1 IN (25 MM) BELOW THE PAVEMENT EDGE. WHERE THE FLOW WILL BE OVER THE SODDED AREAS AND ONTO THE PAVED SURFACES AROUND MANHOLES AND INLETS, THE SURFACE OF THE SOIL IN THE SOD AFTER COMPACTION SHALL BE PLACED FLUSH WITH PAVEMENT EDGES.

14. ON SLOPES STEEPER THAN 1 VERTICAL TO 2-1/2 HORIZONTAL AND IN V-SHAPED OR FLAT-BOTTOM DITCHES OR GUTTERS, THE SOD SHALL BE PEGGED WITH WOODEN PEGS NOT LESS THAN 12 IN (300 MM) IN LENGTH AND HAVE A CROSS-SECTIONAL AREA OF NOT LESS THAN 3/4 SQ IN (18 SQ MM). THE PEGS SHALL BE DRIVEN FLUSH WITH THE SURFACE OF THE SOD.

15. ADEQUATE WATER AND WATERING EQUIPMENT MUST BE ON HAND BEFORE SODDING BEGINS, AND SOD SHALL BE KEPT MOIST UNTIL IT HAS BECOME ESTABLISHED AND ITS CONTINUED GROWTH ASSURED. IN ALL CASES, WATERING SHALL BE DONE IN A MANNER THAT WILL AVOID EROSION FROM THE APPLICATION OF EXCESSIVE QUANTITIES AND WILL AVOID DAMAGE TO THE FINISHED SURFACE. THE CONTRACTOR WILL BE REQUIRED TO WATER SODDED AREAS THREE DAYS PER WEEK UNTIL THE SOD IS WELL ESTABLISHED, HAS GOOD COLOR AND IS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL WATER EVERY OTHER DAY SUCH THAT THE SOD IS WATERED AT LEAST THREE TIMES PER WEEK. IF THE CONTRACTOR DOES NOT WATER THE REQUIRED THREE DAYS PER WEEK, THE DAYS MISSED SHALL HAVE THE PAYMENT FOR SOD PER SQUARE FOOT REDUCED AT A PRO-RATA SHARE BASED UPON THE NUMBER OF TOTAL DAYS CALCULATED FOR WATERING (LESS ANY RAIN DAYS) TIMES THE NUMBER OF DAYS MISSED. IT IS IMPERATIVE THAT THE CONTRACTOR WATER CONSISTENTLY TO ENSURE PROPER SOD GROWTH.

16. GENERAL. THE CONTRACTOR SHALL PROVIDE GENERAL CARE FOR THE SODDED AREAS AS SOON AS THE SOD HAS BEEN LAID AND SHALL CONTINUE UNTIL FINAL INSPECTION AND ACCEPTANCE OF THE WORK.

17. PROTECTION. ALL SODDED AREAS SHALL BE PROTECTED AGAINST TRAFFIC OR OTHER USE BY WARNING SIGNS OR BARRICADES APPROVED BY THE ENGINEER.

18. MOWING. THE CONTRACTOR SHALL MOW THE SODDED AREAS WITH APPROVED MOWING EQUIPMENT. DEPENDING UPON CLIMATIC AND GROWTH CONDITIONS AND THE NEEDS FOR MOWING SPECIFIC AREAS. IN THE EVENT THAT WEEDS OR OTHER UNDESIRABLE VEGETATION ARE PERMITTED TO GROW TO SUCH AN EXTENT THAT, EITHER CUT OR UNCUT, THEY THREATEN TO SMOTHER THE SODDED SPECIES, THEY SHALL BE MOWED AND THE CLIPPINGS RAKED AND REMOVED FROM THE AREA.

19. REPAIRING. WHEN THE SURFACE HAS BECOME BULLIED OR OTHERWISE DAMAGED DURING THE PERIOD COVERED BY THIS CONTRACT, THE AFFECTED AREAS SHALL BE REPAIRED TO RE-ESTABLISH THE GRADE AND THE CONDITION OF THE SOIL, AS DIRECTED BY THE ENGINEER, AND SHALL THEN BE SODDED AS SPECIFIED IN 904-3.5.

MAINTENANCE PLAN

1. THE CONTRACTOR SHALL REVIEW ALL EROSION AND SEDIMENT CONTROL MEASURES FOR STABILITY AND OPERATION FOLLOWING EACH RAINFALL EVENT AND/OR NO LESS THAN ONCE EVERY WEEK.

2. THE CONTRACTOR SHALL REPAIR AS NEEDED OR DIRECTED, IMMEDIATELY, TO ENSURE CONTINUED FUNCTION OF EROSION AND SEDIMENTATION CONTROL MEASURES.

3. THE CONTRACTOR SHALL PERFORM ROUTINE REVIEW OF ALL SILT FENCE TO ENSURE PROPER FUNCTION. SILT FENCE MAINTENANCE SHALL TAKE PLACE, IN ACCORDANCE WITH THE NCDEQ EROSION AND SEDIMENTATION CONTROL DESIGN MANUAL.

4. THE CONTRACTOR SHALL PERFORM ANY AND ALL ADDITIONAL MAINTENANCE, AS REQUIRED BY THE ENGINEER.

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TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	SVO
REVIEWED BY:	AEB

SHEET TITLE

EROSION CONTROL NOTES

SHEET NUMBER

C531

BIDDING DOCUMENTS

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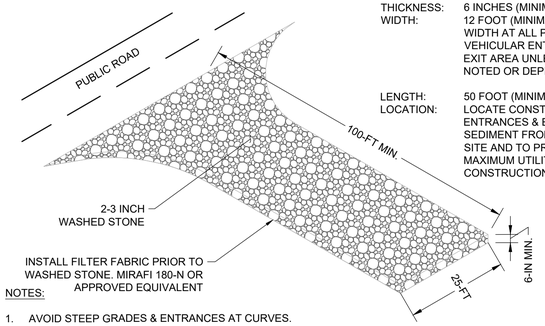


GRAVEL PAD:

AGGREGATE SIZE 2 - 3 INCH WASHED STONE

DIMENSIONS AS FOLLOWS:

THICKNESS: 6 INCHES (MINIMUM)
WIDTH: 12 FOOT (MINIMUM) OR FULL WIDTH AT ALL POINTS OF THE VEHICULAR ENTRANCE AND EXIT AREA UNLESS OTHERWISE NOTED OR DEPICTED

LENGTH: 50 FOOT (MINIMUM)
LOCATION: LOCATE CONSTRUCTION ENTRANCES & EXITS TO LIMIT SEDIMENT FROM LEAVING THE SITE AND TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.

NOTES:

1. AVOID STEEP GRADES & ENTRANCES AT CURVES.
2. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR THIS ITEM.
3. INSPECT THE SURFACE & TOP DRESS THE SURFACE AS NEEDED WITH GRAVEL.

MAINTENANCE REQUIREMENTS:

- MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH CLASS A STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

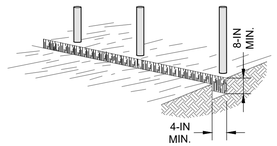
1 TEMPORARY CONSTRUCTION ENTRANCE PAD

NTS

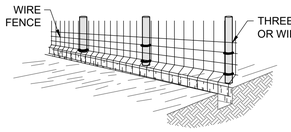
2 PAVEMENT LIP / SHOULDER TRANSITION

NTS

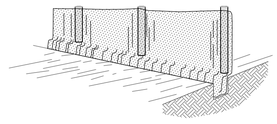
1. SOD MUST BE PLACED WITH NO GAPS BETWEEN ADJACENT SOD BLOCKS.
2. AREA TO BE SODDED MUST BE FINE GRADED TO DRAIN AND ROLLED SMOOTH PRIOR TO SODDING. ALL FOREIGN OBJECTS MUST BE REMOVED PRIOR TO SODDING.
3. ALL SODDED AREA MUST BE ROLLED WITH HEAVY LAWN ROLLERS TO SET THE SOD. THE ROLLED SOD MUST DRAIN FREELY AND CONTAIN NO RUTS, DEPRESSIONS, OR RIDGES.
4. WATER SOD AS NECESSARY TO ESTABLISH GROWTH AND REPLACE ANY SOD WHICH DIES WITHIN A ONE YEAR PERIOD.
5. SOD MUST BE PLACED SUCH THAT A 1.5-IN LIP IS CREATED FROM THE TOP OF THE ADJACENT PAVEMENT TO THE TOP OF THE SOD.



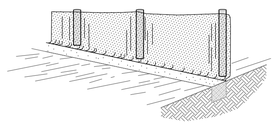
1. SET STEEL POST & EXCAVATE A 4-IN X 8-IN TRENCH UPSLOPE ALONG THE LINE OF POST.



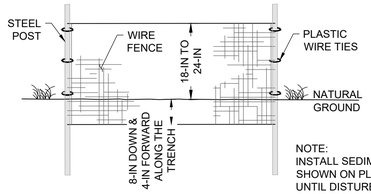
2. ATTACH WIRE FENCING TO STEEL POST WITH PLASTIC OR WIRE TIES.



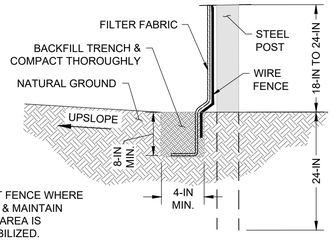
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE & EXTEND IT INTO THE TRENCH.



4. BACKFILL & COMPACT THE EXCAVATED SOIL.



PROFILE VIEW
NOT TO SCALE



CROSS-SECTION VIEW
EXTENSION OF FABRIC & WIRE INTO TRENCH

NOTE:
INSTALL SEDIMENT FENCE WHERE SHOWN ON PLANS & MAINTAIN UNTIL DISTURBED AREA IS COMPLETELY STABILIZED. DOUBLE SILT FENCING TO BE PLACED NO MORE THAN 8-FT APART.

MAINTENANCE:

INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

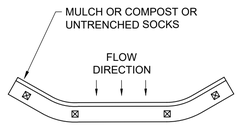
SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.

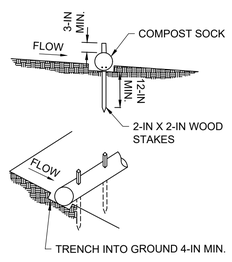
REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

3 TEMPORARY SILT FENCE

NTS



PLAN VIEW (UNTRENCHED OR ENTRENCHED)



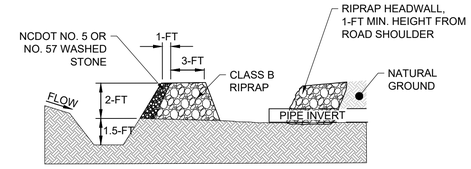
ENTRENCHED INSTALLATION

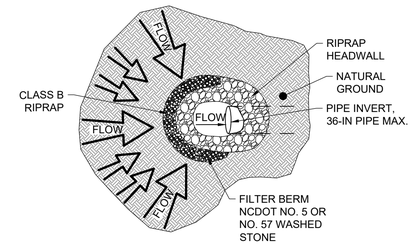
MAINTENANCE:

INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVEN (1/2 INCH OR GREATER). REMOVE ACCUMULATED SEDIMENT AND ANY DEBRIS. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.

4 COMPOST SOCK

NTS





MAINTENANCE:

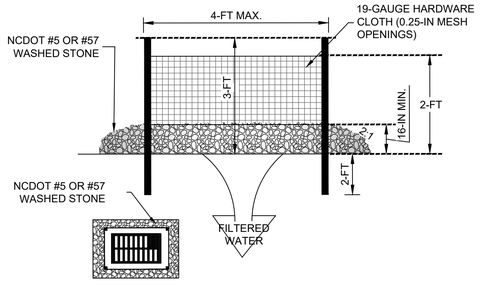
INSPECT ROCK PIPE INLET PROTECTION AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.

CHECK THE STRUCTURE FOR DAMAGE. ANY RIPRAP DISPLACED FROM THE STONE HORSESHOE MUST BE REPLACED IMMEDIATELY.

AFTER ALL THE SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL THE UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND PROVIDE PERMANENT GROUND COVER (SURFACE STABILIZATION).

5 ROCK PIPE INLET PROTECTION

NTS



GENERAL NOTES:

1. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
2. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
3. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
4. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
5. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.
6. MATERIALS, LABOR, AND INSTALLATION ASSOCIATED WITH HARDWARE CLOTH AND GRAVEL INLET PROTECTION SHALL BE INCIDENTAL TO DROP INLET PROTECTION PAY ITEM.

6 HARDWARE CLOTH & GRAVEL INLET PROTECTION

NTS

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

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DATE ISSUED:	04/02/2026
DESIGN BY:	SVO
DRAWN BY:	ERG
REVIEWED BY:	AEB

SHEET TITLE
EROSION CONTROL DETAILS (1 OF 3)

SHEET NUMBER
C532

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TEMPORARY SEEDING RECOMMENDATIONS
FOR LATE WINTER AND EARLY SPRING

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding Dates
Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER

Seeding Mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding Dates
Mountains — May 15 - Aug. 15
Piedmont — May 1 - Aug. 15
Coastal Plain — Apr. 15 - Aug. 15

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR FALL

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120

Seeding Dates
Mountains — Aug. 15 - Dec. 15
Coastal Plain and Piedmont — Aug. 15 - Dec. 31

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1-1$\frac{1}{2}$ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700 - 1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NORTH CAROLINA
Department of Environmental Quality

TEMPORARY SEEDING

Effective Date: 9/1/2023
In accordance with the 2013 Design Manual Updates

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FAYETTEVILLE, NC

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DRAWN BY: ERG
REVIEWED BY: SVO

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EROSION CONTROL DETAILS (2 OF 3)

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NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:
Significant maintenance may be required to obtain desired cover.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:
Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:
Hard Fescue is not recommended for slopes > 5%. Prefers shade.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 $\frac{1}{2}$ tons/acre on coarse0textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. the finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. all ridges and depressions shall be removed and filled to provide the approved surface drainage . Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:

1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframes table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast0growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must cover at leaser 80% of the soil surface.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA Department of Environmental Quality

PERMANENT SEEDING

Effective Date: 9/1/2023
In accordance with the 2013 Design Manual Updates

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REVIEWED BY:	SVO

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GENERAL NOTES

1. PROJECT PAY ITEMS: THE PROJECT PAY ITEMS ARE PROVIDED TO BE INCLUSIVE OF ALL WORK TO BE PERFORMED AS SHOWN IN THE CONTRACT DOCUMENTS. ALL WORK NOT IDENTIFIED WITH A SPECIFIC PAY ITEM IS TO BE CONSIDERED REQUIRED WORK TO COMPLETE THE PROJECT AND IS TO BE SUBSIDIARY TO THE COST OF PROJECT PAY ITEMS PROVIDED.

2. WHENEVER, IN THE CONTRACT DOCUMENTS, THE WORDS "PROVIDE", "FURNISH", "INSTALL", "FURNISH AND INSTALL", OR OTHER WORDS OF LIKE IMPORT ARE USED, IT SHALL BE UNDERSTOOD THAT THE INTENT OF THE CONTRACT DOCUMENTS IS TO PROVIDE FOR THE CONSTRUCTION AND COMPLETION IN EVERY DETAIL OF THE WORK DESCRIBED. IT IS FURTHER INTENDED THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, SUPPLIES, TESTING AND INCIDENTALS REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE DRAWINGS (PLANS), SPECIFICATIONS AND TERMS OF THE CONTRACT.

3. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, ETC., PRIOR TO COMMENCEMENT OF WORK. THE COST OF PERMITS, LICENSES, ETC., SHALL BE INCIDENTAL TO AND INCLUDED IN THE BID PRICE FOR THE RESPECTIVE PAY ITEMS.

4. CIVIL INFORMATION IS SHOWN ON ELECTRICAL DRAWINGS FOR REFERENCE ONLY.

5. ITEMS SHOWN IN SCREEN (GHOST) ARE CIVIL AND EXISTING ELECTRICAL ITEMS. ITEMS SHOWN IN SOLID (BOLD) ARE EXISTING ELECTRICAL ITEMS TO BE DEMOLISHED OR MODIFIED (DEMOLITION PLANS), OR NEW ELECTRICAL ITEMS TO BE INSTALLED UNDER THIS CONTRACT (LAYOUT AND CIRCUITING PLANS), UNLESS OTHERWISE NOTED.

6. ALL EXCAVATION WITHIN 5 FEET OF AN UNDERGROUND UTILITY SHALL BE PERFORMED BY HAND EXCAVATION METHODS. IF ENCOUNTERED, EXISTING DIRECT BURIED CABLES TO REMAIN SHALL BE ENCLOSED IN SPLIT DUCT AND ENCASED IN A 3" ENVELOPE OF P-610 CONCRETE UNDER THE FOLLOWING CONDITIONS:

   A. WHEN WITHIN 20 FEET OF EXCAVATION, TRENCHING, ETC.

   B. WHEN PAVEMENT WIDENING OR EXTENSIONS WILL BE ROUTED OVER THE EXISTING CABLE. THE SPLIT DUCT WILL EXTEND 20 FEET BEYOND THE NEW EDGE OF PAVEMENT.

   C. WHEN ENCOUNTERED DURING CONSTRUCTION.

   D. WHEN SUBJECT TO DAMAGE, IN THE OPINION OF THE OWNER/ENGINEER, FROM CONSTRUCTION ACTIVITIES.

7. THE CONTRACTOR SHALL BEFORE STARTING CONSTRUCTION, VISIT THE SITE OF THE PROJECT AND VERIFY EXISTING CONDITIONS.

8. EXISTING CONDUIT, DUCT BANK, CIRCUITING AND UTILITY INFORMATION IS BASED ON "AS-BUILT" AND "RECORD" DRAWINGS, AND SITE VISITS BY THE ENGINEER. THE EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL NOT BE SCALED FOR EXACT LOCATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE APPROPRIATE UTILITY/ AGENCY, PRIOR TO STARTING WORK, AND STAKE/MARK THE LOCATION OF ALL EXISTING UTILITIES. ANY INTERRUPTION OF AN EXISTING SYSTEM OR UTILITY SERVICE SHALL BE COORDINATED AND APPROVED BY THE AUTHORITY, AGENCY OR UTILITY HAVING JURISDICTION, PRIOR TO STARTING WORK.

9. ALL EXISTING SYSTEMS/UTILITIES TO REMAIN SHALL BE PROTECTED FROM DAMAGE. REPLACEMENT OR REPAIR OF ANY DAMAGED EXISTING SYSTEMS/ UTILITIES TO REMAIN SHALL BE AT NO ADDITIONAL COST TO THE OWNER. ALL DAMAGED SYSTEMS SHALL BE IMMEDIATELY REPAIRED WITHIN 24 HOURS TO THE SATISFACTION OF THE OWNER. FAA CABLES CANNOT BE SPLICED. DAMAGE TO FAA CABLES WILL RESULT IN THE CONTRACTOR BEING RESPONSIBLE FOR COMPLETE REPLACEMENT OF THE FAA CABLE.

10. ELECTRICAL DEMOLITION WORK SHALL BE LIMITED TO THE AREAS AND SCHEDULES IDENTIFIED IN THE APPROVED PHASING PLAN. TEMPORARY JUMPER NEEDED TO MAINTAIN ELECTRICAL CONTINUITY AROUND CLOSED WORK AREA ARE SHOWN ON THE DEMOLITION PLANS. THE CONTRACTOR MAY NEED ADDITIONAL "JUMPERS".

11. ALL WORK SHOWN ON THE EXISTING CONDITIONS AND DEMOLITION DRAWINGS IS BASED ON FIELD OBSERVATION OF THE ACTUAL EXISTING CONDITIONS AND ON EXISTING "AS-BUILT" DRAWINGS OF THE AREAS AFFECTED. THEY ARE THEREFORE CONSIDERED TO BE SCHEMATIC. IT IS THE INTENT OF THE DEMOLITION DRAWINGS THAT ALL EQUIPMENT, DEVICES, FIXTURES, WIRING MATERIALS, SYSTEMS AND APPURTENANCES, ETC., WHICH ARE NO LONGER REQUIRED AS A RESULT OF THE PROJECT BE REMOVED.

12. ALL REMOVED FIXTURES, BASE PLATES, SPACERS, SIGNS, TRANSFORMERS, CABLES, DUCTS, BASE CANS, CONCRETE PADS, JUNCTION CANS, HANDHOLES, MANHOLES, ETC., SHALL BE PROPERLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR UNLESS OTHERWISE NOTED ON PLANS. THE AIRPORT HAS THE FIRST RIGHT OF REFUSAL OF ALL MATERIALS REMOVED AS A PART OF THIS PROJECT. ITEMS SHALL BE PROVIDED TO THE AIRPORT OR PROPERLY DISPOSED OF AT THEIR DIRECTION. ANY ITEMS DAMAGED DURING REMOVAL THAT THE AIRPORT HAS INDICATED THEY WOULD LIKE SALVAGED, WILL BE REPLACED AT CONTRACTOR'S EXPENSE.

13. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO DETERMINE THAT ALL AIRFIELD LIGHTING CIRCUITS, EXCEPT THOSE THAT ARE SERVING CLOSED TAXIWAYS OR RUNWAYS, ARE COMPLETELY OPERATIONAL AT THE END OF EACH WORK SHIFT AND SHALL SO CERTIFY TO THE RESIDENT ENGINEER/INSPECTOR AND OWNER BEFORE THE END OF EACH SHIFT. THE CONTRACTOR SHALL NOT LEAVE THE WORK SITE UNTIL CIRCUIT OPERATION HAS BEEN CONFIRMED BY THE RESIDENT ENGINEER/INSPECTOR AND OWNER.

14. THE CONTRACTOR SHALL COMPLETELY SURVEY AND STAKE OUT EACH AREA'S LIGHTING LAYOUT PRIOR TO STARTING ANY INSTALLATION. SHOULD ANY IRREGULARITIES OCCUR IN THE LIGHTING LAYOUT, THE OWNER SHALL BE NOTIFIED IMMEDIATELY. THE BID ITEM PRICE SHALL INCLUDE THE NECESSARY LAYOUT FOR EACH FIXTURE, AND THE COST FOR ANY ADDITIONAL ADJUSTMENT OF THE LOCATION OF THE FIXTURES, DUE TO THE EXISTING GEOMETRIC CONDITIONS. THE NEW LIGHTING INSTALLATION SHALL BE COORDINATED WITH AND BLEND INTO THE EXISTING INSTALLATION.

15. IF A LIGHT CAN IS INSTALLED INCORRECTLY, THE DUCT/CONDUIT IS PLUGGED/BROKEN THE CONCRETE SLABS OR ASPHALT PAVEMENT AROUND THE LIGHT CAN, AND THE LIGHT, SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER.

16. LOCATE AND UTILIZE EXISTING DUCTS WHERE POSSIBLE. MANDREL EXISTING DUCTS TO DETERMINE ACCEPTABILITY FOR USE. THE COST OF MANDRELLING THE EXISTING DUCTS SHALL BE INCIDENTAL TO THE NEW DUCT INSTALLATION PAY ITEM. IF EXISTING DUCTS SHOWN ARE DAMAGED, NON-EXISTENT, OR ROUTED DIFFERENTLY, WITH THE PERMISSION OF THE OWNER, OPEN CUT PAVEMENT AND INSTALL NEW DUCT AS DETAILED IN THE PLANS.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE OF ALL ITEMS REQUIRING STORAGE PRIOR TO REINSTALLATION. ALL SIGNS UNITS, LIGHT FIXTURES, ETC. SHALL BE REINSTALLED OR RETURNED TO THE OWNER UNDAMAGED, IN PROPER WORKING CONDITION, CLEANED AND RE-LAMPED. ITEMS WHICH ARE DAMAGED PRIOR TO CONTRACTOR POSSESSION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BY THE CONTRACTOR PRIOR TO DEMOLITION AND SHALL BE PHOTO DOCUMENTED. ANY ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES OR STORAGE SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.

18. THE DIMENSION BETWEEN LIGHTS SHOWN ON A RADIUS IS DEFINED AS THE CHORD LENGTH. LOCATIONS SHOWN ARE TO THE CENTER OF THE LIGHTING FIXTURE. THE DIMENSION SHOWN ARE ESTIMATED. THE CONTRACTOR SHALL SURVEY THE ACTUAL DIMENSIONS AND MODIFY THE LIGHT SPACING AS NEEDED. THE COST SHALL BE INCIDENTAL TO THE LIGHT INSTALLATION.

19. ALL MANHOLES OR HANDHOLES SHALL BE INSTALLED AS SHOWN ON PLANS. MANHOLES OR HANDHOLES SHALL NOT BE INSTALLED IN DITCHES, DRAINAGE SWALES OR WHERE WATER WILL POND ON TOP OF THE MANHOLE/HANDHOLE.

20. DEWATERING FOR THE INSTALLATION OF MANHOLES, HANDHOLES, BASE CANS, DUCT BANKS OR CONDUITS ARE INCIDENTAL TO THE RESPECTIVE PAY ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ANY AND ALL PERMITS REQUIRED FOR DEWATERING.

21. THE ELECTRICAL CONTRACTOR SHALL ATTEND THE CONSTRUCTION MEETINGS, HELD WEEKLY, FOR THE DURATION OF THE PROJECT.

22. ALL ELECTRICAL DEMOLITION SHALL INCLUDE FOUNDATION REMOVAL AND BACKFILL PER P-152. SEE SPECIFICATION T-901 AND T-904 FOR SEEDING AND SODDING REQUIREMENTS. NO SEPARATE PAYMENT SHALL BE MADE FOR RESTORATION.

23. GROUNDING SHALL BE IN ACCORDANCE WITH SPECIFICATION L-108 AND FAA AC 150/5340-30 (LATEST EDITION). THE RESISTANCE FROM THE GROUND ROD TO EARTH MUST BE 25 OHMS OR LESS PRIOR TO CONNECTION TO THE GROUND SYSTEM. IF THE 25 OHM REQUIREMENT IS NOT MET, ADDITIONAL GROUND ROD SECTIONS SHALL BE INSTALLED. ALL TESTING SHALL BE WITNESSED BY THE RESIDENT ENGINEER/INSPECTOR OR OWNER. THE CONTRACTOR SHALL SUBMIT ALL GROUND RESISTANCE TESTING RESULTS TO OWNER AT THE END OF THE PROJECT. IF MORE THAN 2 GROUND BARS ARE NEEDED TO MEET THE 25 OHM REQUIREMENT, THE ENGINEER/OWNER SHALL BE NOTIFIED PRIOR TO INSTALLATION.

24. ALL EQUIPMENT PROVIDED IN THIS PROJECT SHALL BE LISTED IN FAA AC 150-5345-53 APPENDIX (LATEST EDITION).

25. ALL EXISTING CONDUCTORS SHALL BE TESTED FOR INSULATION RESISTANCE PRIOR TO WORKING ON CIRCUIT USING A 1000V MEGGER AND SHALL BE RETURNED TO SERVICE WITH MATCHING OR BETTER INSULATED RESISTANCE READINGS. ALL PROPOSED CONDUCTORS SHALL BE TESTED FOR INSULATION RESISTANCE PRIOR TO CONNECTING TO EXISTING CIRCUIT, USING A 1000V MEGGER. NEW PORTIONS OF CIRCUITS SHALL BE COMPLETE FOR TESTING. ALL TESTING SHALL BE WITNESSED BY THE RESIDENT ENGINEER/INSPECTOR OR OWNER. ALSO, CONTRACTOR SHALL SUBMIT ALL INSULATION RESISTANCE TESTING RESULTS TO OWNER AT THE END OF THE PROJECT.

26. THE FAYETTEVILLE REGIONAL AIRPORT MAINTENANCE DEPARTMENTS "LOCKOUT/TAGOUT" PROCEDURE SHALL BE COMPLIED WITH BY THE CONTRACTOR. CONTACT AIRPORT MAINTENANCE TO "LOCKOUT/TAGOUT" REGULATORS AND FOR A COPY OF FAYETTEVILLE REGIONAL AIRPORT MAINTENANCE DEPARTMENTS "LOCKOUT/TAGOUT" PROCEDURE. THE CONTRACTOR SHALL COMPLY WITH ALL SAFETY PROCEDURES OUTLINED IN AC 150/5340-26B (LATEST EDITION).

27. BY OPENING THESE SHEETS IN AUTOCAD, THE USER AGREES THAT DATA PROVIDED BY ELECTRONIC FILES ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD BE USED AT ONE'S OWN RISK. THE ENGINEER MAKES NO REPRESENTATIONS, WRITTEN OR VERBAL, THAT THE INFORMATION CONTAINED IN THESE DIGITAL FILES IS COMPLETE OR ACCURATE OR SHOULD BE RELIED UPON FOR CONSTRUCTION. ANY CONFLICT BETWEEN THE INFORMATION REFLECTED ON THE SEALED PLAN SHEETS AND ELECTRONIC DATA SHALL BE RESOLVED IN FAVOR OF THE SEALED PLAN SET.

28. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE WORK WITH THE APPROPRIATE UTILITIES AS NECESSARY. THE CONTRACTOR MAY BE REQUIRED TO WORK CONCURRENTLY WITH OR "WORK AROUND" EXISTING UTILITIES. THE CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION FOR ANY DELAYS OR INCONVENIENCE CAUSED BY UTILITY COMPANIES.

29. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY A MINIMUM OF 7 DAYS PRIOR TO BEGINNING ANY EXCAVATION WORK TO HAVE UNDERGROUND UTILITIES MARKED ON THE GROUND.

30. THE CONTRACTOR SHALL COORDINATE ALL ELECTRICAL SHUTDOWNS WITH THE FAA AND AIRPORT A MINIMUM OF 30 DAYS IN ADVANCE.

ABBREVIATIONS:

AWG	-	AMERICAN WIRE GAUGE
ALCMS	-	AIRFIELD LIGHTING CONTROL AND MONITORING SYSTEM
BSDC	-	BARE SOFT DRAWN COPPER
CC	-	CENTER TO CENTER
CE	-	CONCRETE ENCASED
CKT	-	CIRCUIT
CL	-	CENTERLINE
COMM	-	COMMUNICATION
CU	-	COPPER
DD	-	DIRECTIONAL DRILLED
DEB	-	DIRECT EARTH BURIED
DIA	-	DIAMETER
ELD	-	ELECTRICAL LINE DISTRIBUTION
EOP	-	EDGE OF PAVEMENT
EQ	-	EQUAL
FAY	-	FAYETTEVILLE REGIONAL AIRPORT
FOC	-	FIBER OPTIC CABLE
FOTS	-	FIBER OPTIC TRANSMISSION SYSTEM
GSE	-	GROUND SERVICE EQUIPMENT
HDPE	-	HIGH DENSITY POLYETHYLENE
IFR	-	INSTRUMENT FLIGHT RULES
ILC	-	INDIVIDUAL LIGHT CONTROLLER
IPRF	-	INNOVATIVE PAVEMENT RESEARCH FOUNDATION
IP	-	INFLECTION POINT
JCP	-	JUNCTION CAN PLAZA
KV	-	KILOVOLT
MAX	-	MAXIMUM
MIN	-	MINIMUM
MITL	-	MEDIUM INTENSITY TAXIWAY EDGE LIGHT
PC	-	POINT OF CURVATURE
PI	-	POINT OF INFLECTION
PS	-	PAVEMENT SENSOR
PT	-	POINT OF TANGENCY
PVC	-	POLYVINYL CHLORIDE
RGS	-	RIGID GALVANIZED STEEL
RWY	-	RUNWAY
SCH	-	SCHEDULE
SCHED	-	SCHEDULE
SP	-	SPACES
TWY	-	TAXIWAY
TYP	-	TYPICAL
UGE	-	UNDERGROUND ELECTRICAL
UNO	-	UNLESS NOTED OTHERWISE
WWF	-	WELDED WIRE FABRIC

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ELECTRICAL GENERAL NOTES AND ABBREVIATIONS

SHEET NUMBER

E001

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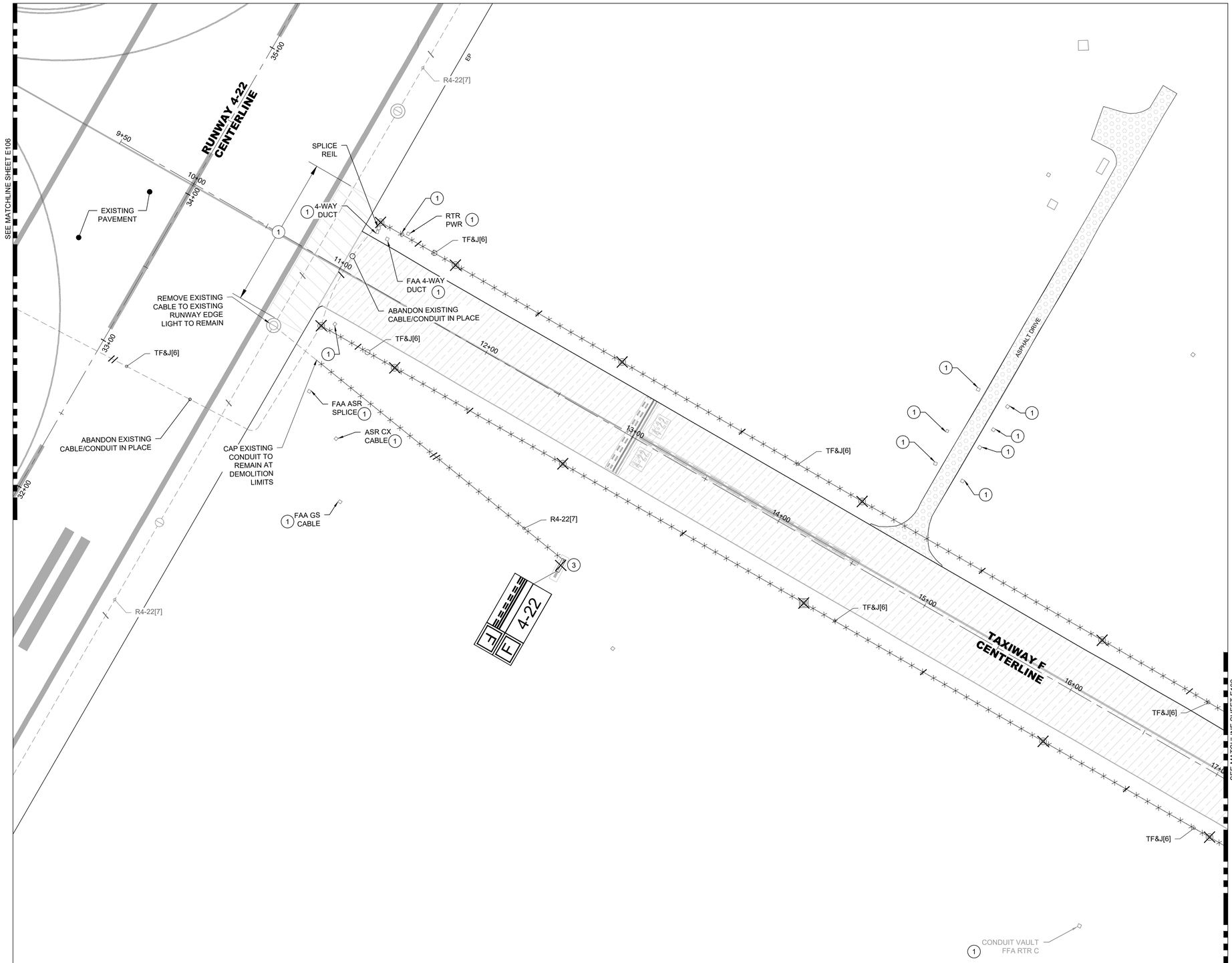

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- EXISTING ASPHALT MILLING
- FULL DEPTH DEMOLITION
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KEYNOTES

1. PROTECT EXISTING ELECTRICAL STRUCTURE / DUCT / CONDUIT BANK IN PLACE
2. SURVEY LOCATION OF EXISTING IN-PAVEMENT RUNWAY EDGE LIGHT. REMOVE AND PROPERLY STORE EXISTING FIXTURE FOR REINSTALLATION AT SAME LOCATION. DEMOLISH EXISTING BASE CAN, TRANSFORMER, AND CONNECTORS.
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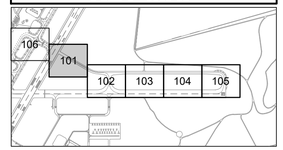
KEY MAP



NORTH

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SCALE (IN FEET)

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SHEET TITLE

ELECTRICAL DEMOLITION PLAN

SHEET NUMBER

E101

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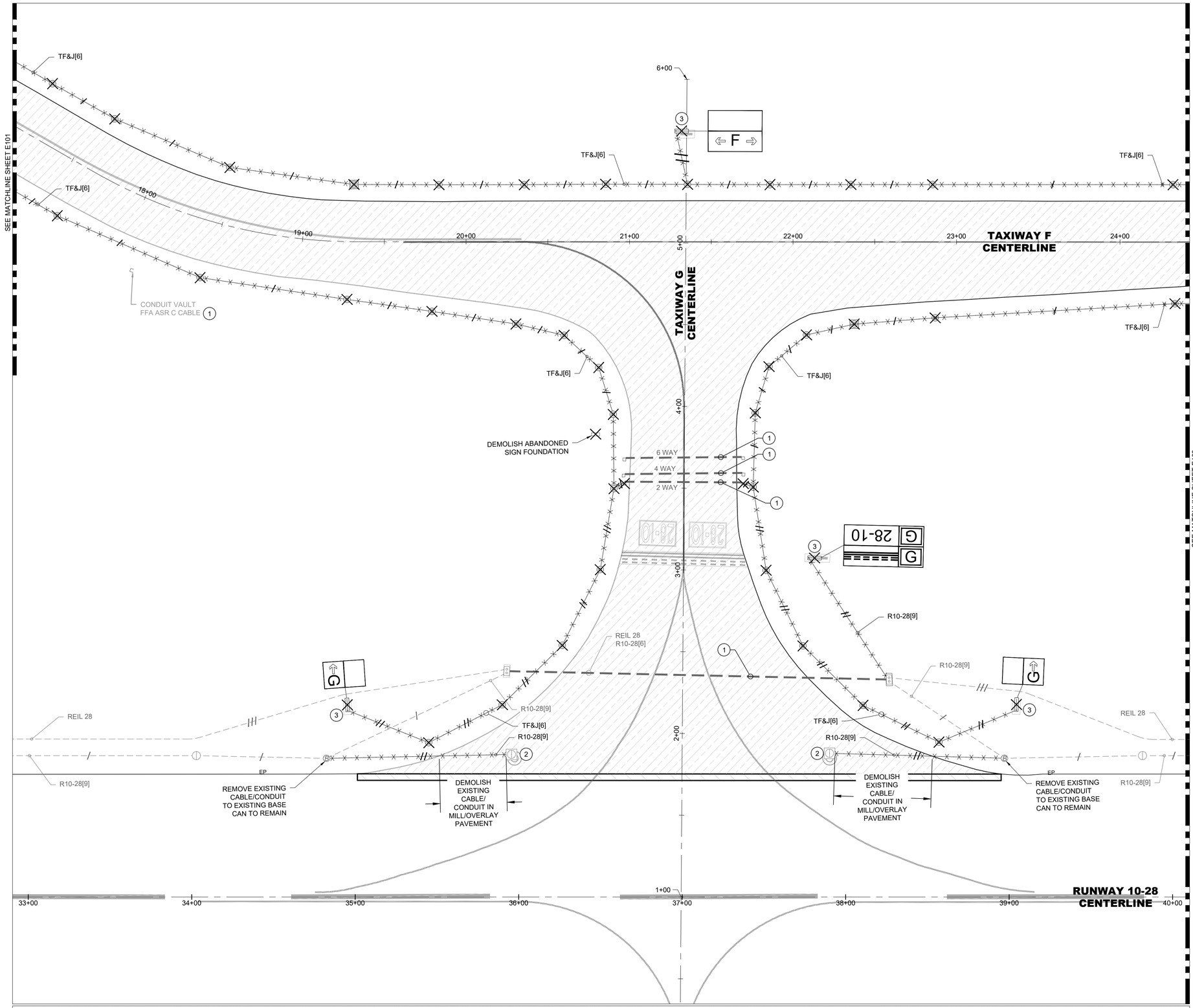

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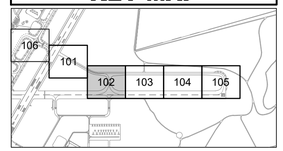

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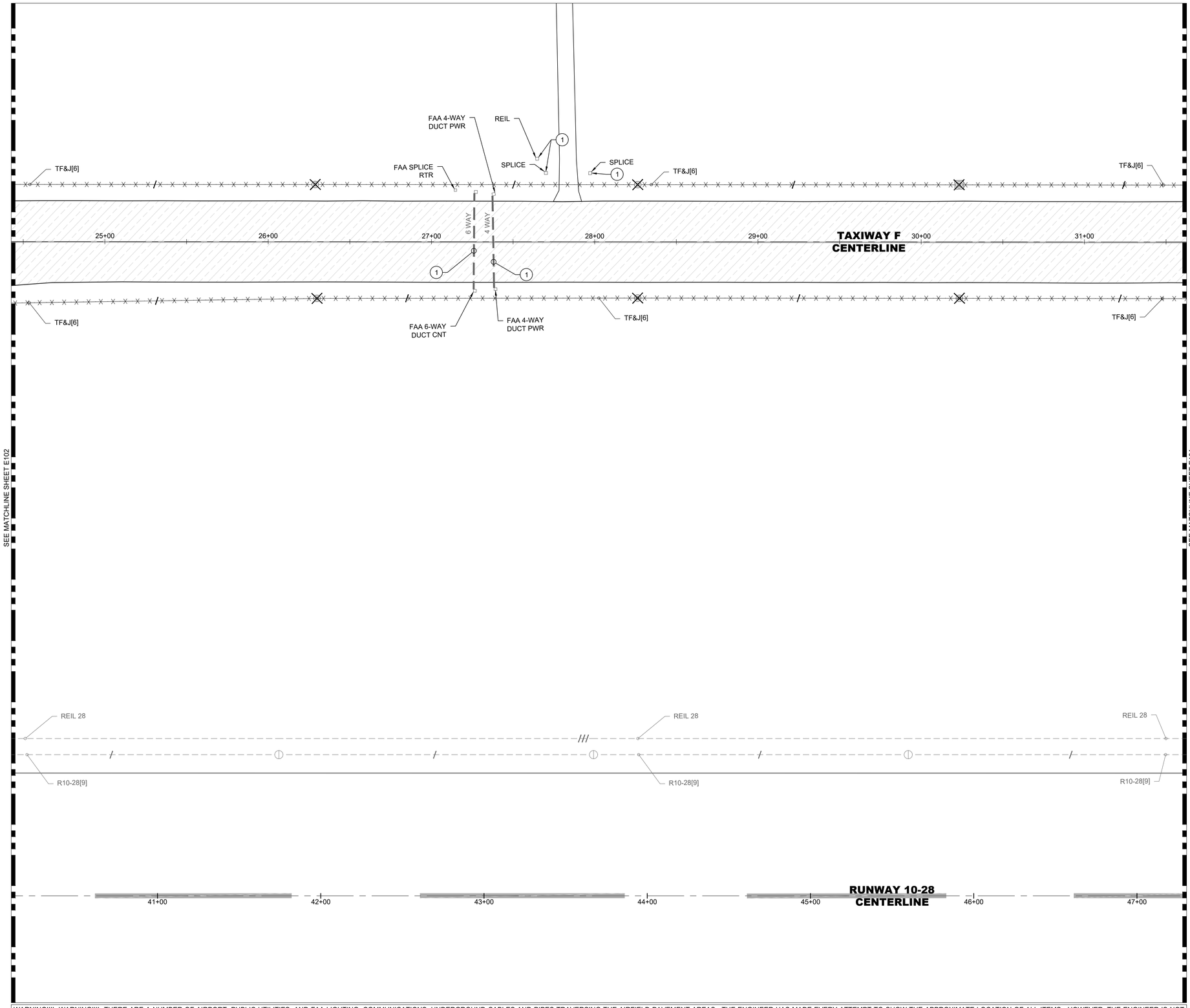

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- ASPHALT PAVEMENT TIE IN

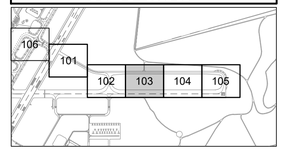
DEMOLITION NOTES

1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDUITS/DUCT BANKS PRIOR TO START OF DEMOLITION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER/OWNER OF ANY BLOCKAGES AND/OR DISCREPANCIES BETWEEN EXISTING CONDITIONS AND WHAT IS SHOWN ON THE PLANS.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CONTINUITY OF EXISTING CIRCUITS OUTSIDE THE LIMITS OF THE CURRENT CONSTRUCTION PHASE.
3. CABLE LOCATIONS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY BY ELECTRONIC DEVICES, THE LOCATIONS, SIZES, TYPE, ETC. OF ALL UNDERGROUND UTILITIES WITHIN THIS AREA PRIOR TO ANY CONSTRUCTION.

KEYNOTES

1. PROTECT EXISTING ELECTRICAL STRUCTURE / DUCT / CONDUIT BANK IN PLACE
2. SURVEY LOCATION OF EXISTING IN-PAVEMENT RUNWAY EDGE LIGHT. REMOVE AND PROPERLY STORE EXISTING FIXTURE FOR REINSTALLATION AT SAME LOCATION. DEMOLISH EXISTING BASE CAN, TRANSFORMER, AND CONNECTORS.
3. REMOVE EXISTING SIGN FROM EXISTING FOUNDATION AND TURN OVER TO OWNER. DEMOLISH EXISTING SIGN FOUNDATION.

KEY MAP



NORTH

SCALE (IN FEET)
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DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL DEMOLITION PLAN

SHEET NUMBER

E103

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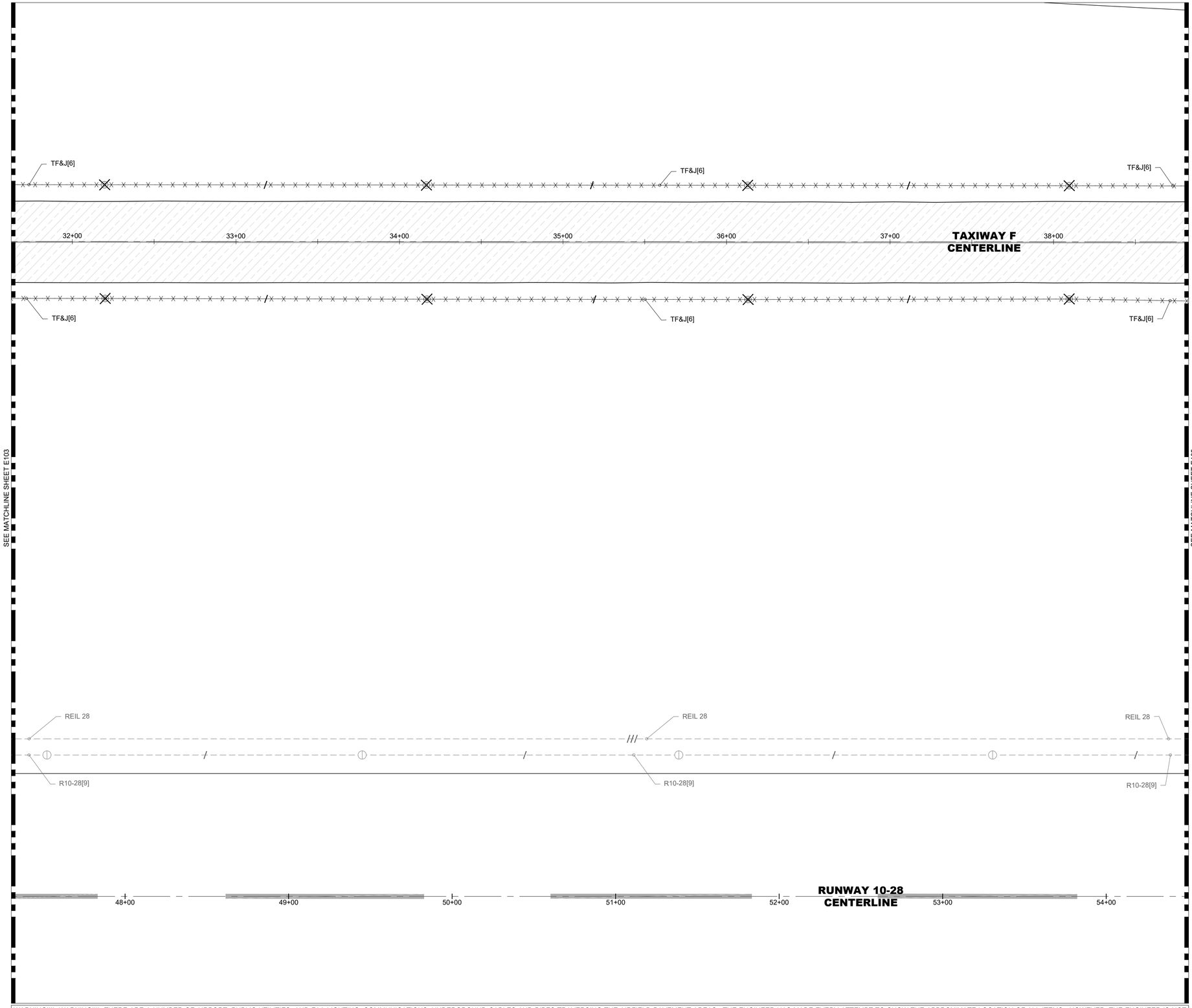

ELECTRICAL LEGEND

- EXISTING TAXIWAY EDGE LIGHT BASE MOUNTED
- EXISTING TAXIWAY EDGE LIGHT STAKE MOUNTED
- EXISTING AIRFIELD GUIDANCE SIGN
- EXISTING BASE CAN
- EXISTING ELEVATED RUNWAY EDGE LIGHT
- EXISTING IN-PAVEMENT RUNWAY EDGE LIGHT
- EXISTING TWO CAN JUNCTION CAN PLAZA
- # WAY — EXISTING DUCT BANK '# WAY' = NUMBER OF CONDUITS INSIDE DUCT
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- T X [#] — CCR NUMBER; X = RUNWAY OR TAXIWAY IDENTIFIER; T = TAXIWAY; R = RUNWAY

CIVIL LEGEND

- EXISTING GRAVEL DRIVE
- EXISTING ASPHALT MILLING
- FULL DEPTH DEMOLITION
- DEMOLISH CONCRETE FLUME
- ASPHALT PAVEMENT TIE IN

DEMOLITION NOTES

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KEYNOTES

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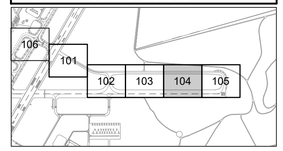

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ELECTRICAL DEMOLITION PLAN

SHEET NUMBER

E104

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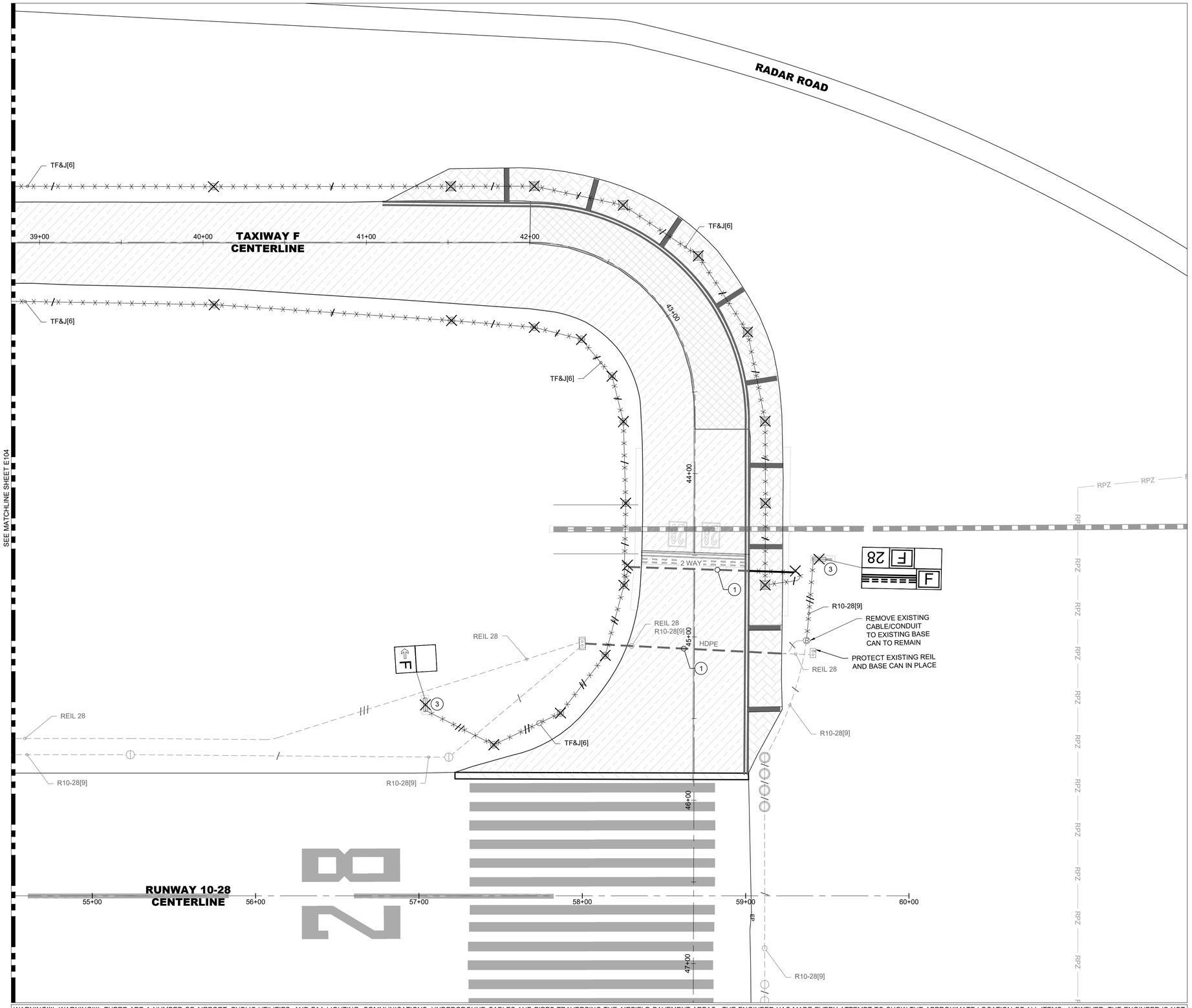

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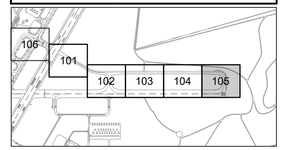

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ELECTRICAL DEMOLITION PLAN

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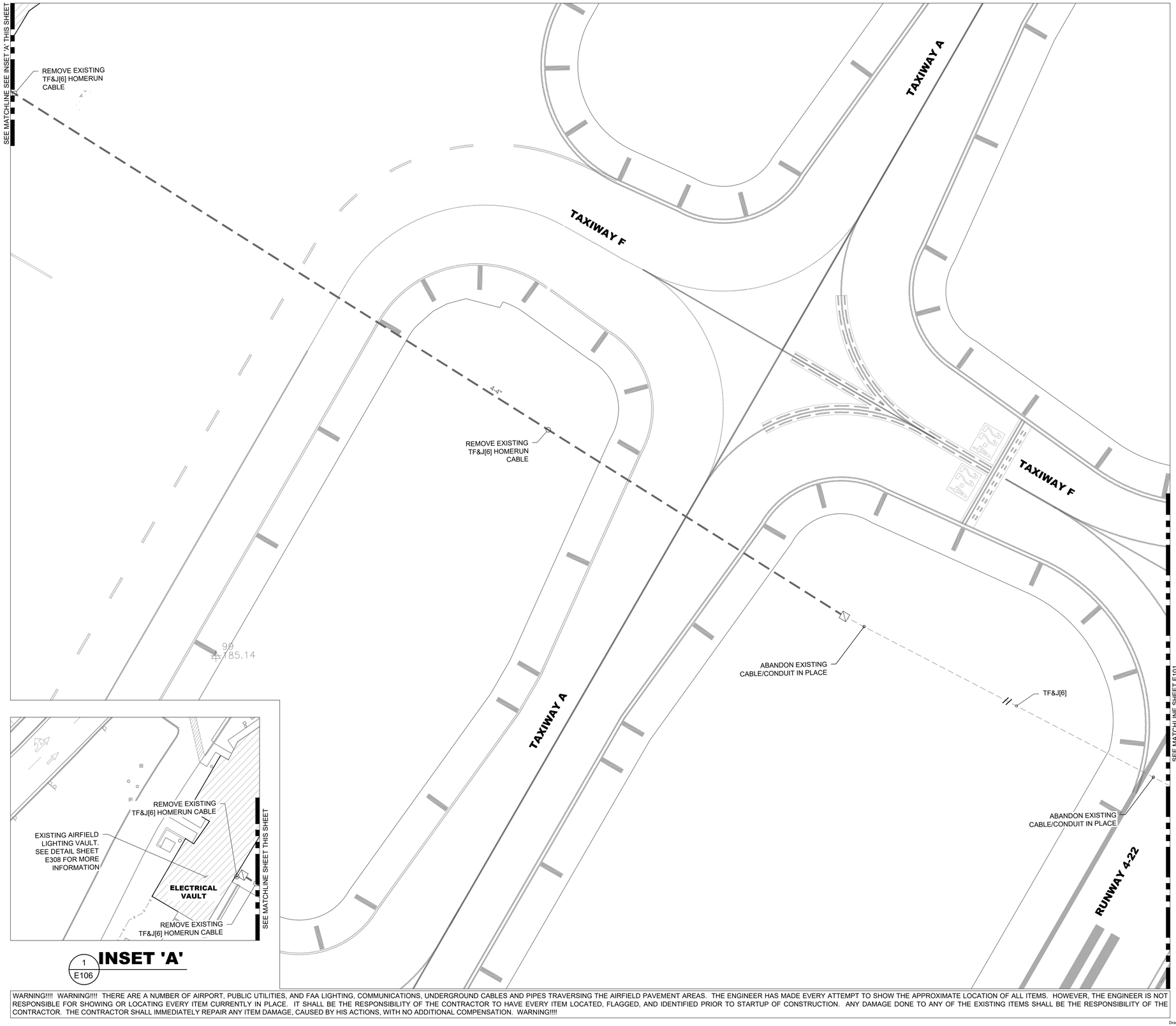

1 E106 **INSET 'A'**

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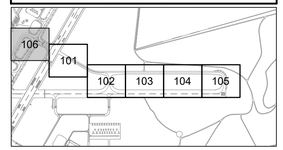

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ELECTRICAL DEMOLITION PLAN

SHEET NUMBER

E106

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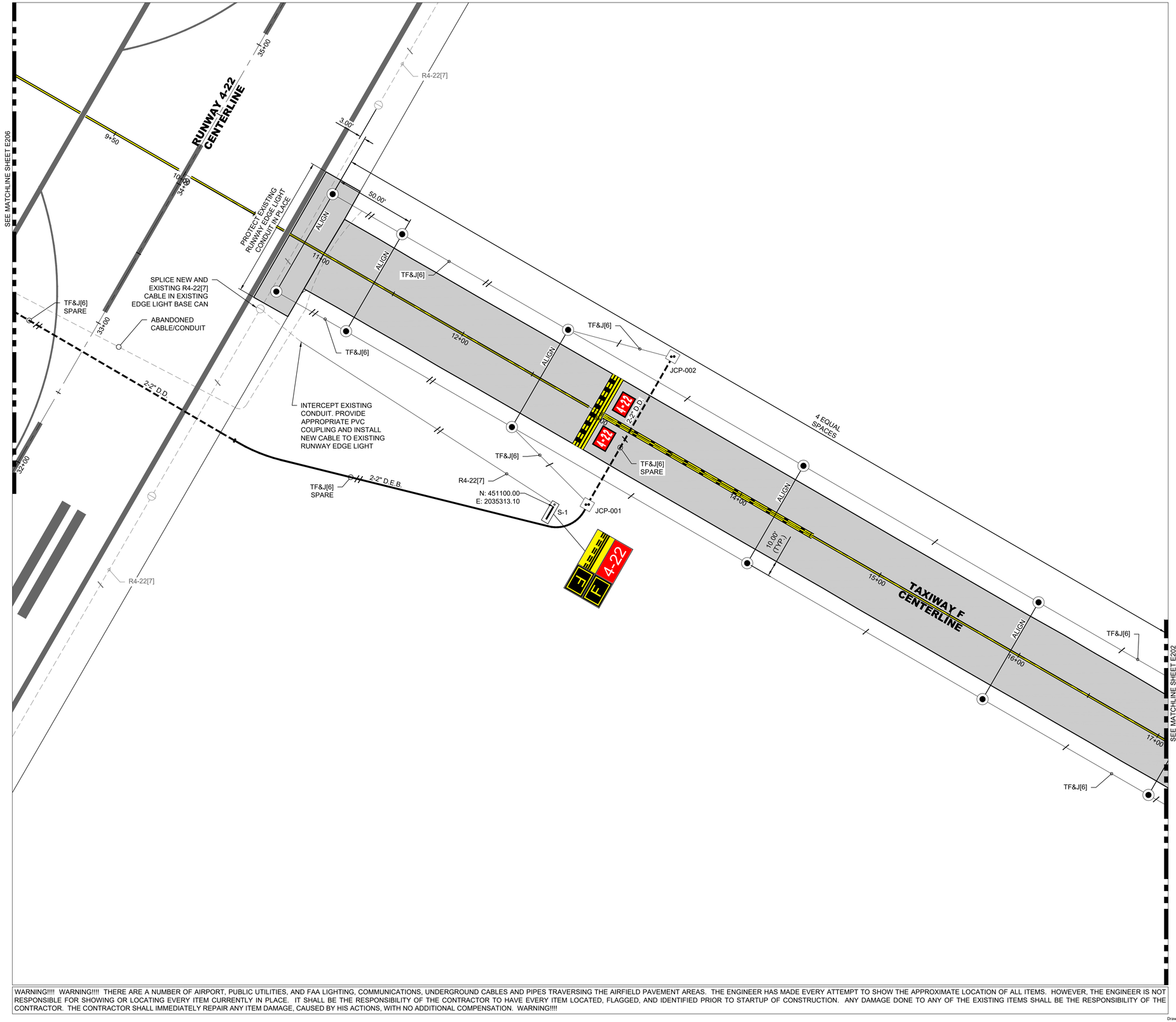

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LEGEND

NEW L-861T(L), OMNIDIRECTIONAL, BLUE, WITH UV RESISTANT POLYCARBONATE LENS, LED, ELEVATED TAXIWAY EDGE LIGHT, COLUMN MOUNTED ON AN L-867B, CLASS 1A, 24" DEEP BASE CAN WITH A "CORTEN" OR APPROVED EQUAL BASE PLATE. PROPERLY SIZED L-830 TRANSFORMER AND L-823 CONNECTORS. THE OVERALL HEIGHT SHALL BE 14", UNLESS OTHERWISE NOTED.

L-858(L) B,Y,R,L LED AIRFIELD GUIDANCE SIGN, INSTALLED ON A CONCRETE BASE WITH L-867B 24" DEEP BASE CAN, PROPERLY SIZED L-830 TRANSFORMER AND L-823 CONNECTORS.

PROPOSED JUNCTION CAN PLAZA WITH 2 L867D JUNCTION CANS

2-2" D.E.B.
NEW 2 WAY 2" SCH. 40 PVC DIRECT EARTH BURIED DUCT

2-2" D.D.
NEW 2 WAY 2" HDPE DIRECTIONAL DRILL DUCT

TX[#]
NEW 2" SCHEDULE 40 PVC CONDUIT, DIRECT EARTH BURIED IN TURF. NUMBER OF TIC MARKS INDICATES THE NUMBER OF NEW L-824, TYPE C, 5KV, #8 AWG CABLES INSTALLED IN DUCT.
TX[#] = CIRCUIT DESIGNATOR

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CIVIL LEGEND

PROPOSED MILL AND OVERLAY

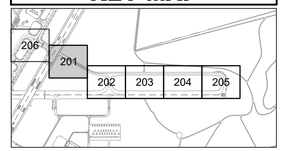
NOTES

1. THE DIMENSIONS SHOWN ARE ESTIMATED. THE CONTRACTOR SHALL SURVEY THE ACTUAL DIMENSIONS AND MODIFY THE LIGHT SPACING AS NEEDED. THE SURVEY MUST INCLUDE ANY NECESSARY INFORMATION SUCH AS, BUT NOT LIMITED TO, EXISTING LIGHT LOCATIONS, PAVEMENT EDGE, PAVEMENT POINTS OF TANGENCY OR INTERSECTION POINTS, OR ANY OTHER FEATURE REQUIRED TO INSTALL LIGHTS PER DIMENSIONS AND FAA AC 150/5340-30 (CURRENT EDITION). THE COST SHALL BE INCIDENTAL TO THE LIGHT AND SIGN INSTALLATIONS.
2. THE CONTRACTOR SHALL SURVEY ALL POINTS OF TANGENCY (PT) AND INTERSECTION POINT (IP) AS SHOWN ON THE PLANS. THE CONTRACTOR MUST PROVIDE THE SURVEYED LOCATIONS TO THE ENGINEER AS A SHOP DRAWING FOR REVIEW. THE CONTRACTOR IS TO STAKE OUT LOCATIONS OF EACH LIGHT PRIOR TO CONSTRUCTION AND CONFIRM WITH THE ENGINEER.
3. CONTRACTOR SHALL FIELD VERIFY EXISTING TAXIWAY EDGE LIGHT LOCATION AND CONFIRM DIMENSION SHOWN PRIOR TO LAYOUT.

KEYNOTES

1. INTERCEPT EXISTING DUCT BANK. PROVIDE APPROPRIATELY SIZED COUPLING AND EXTEND EXISTING DUCT BANK 15' TO NEW JUNCTION CAN PLAZA
2. REINSTALL EXISTING LIGHT FIXTURE ON NEW L-868B BASE CAN AT EXISTING FIXTURE'S SURVEYED LOCATION WITH NEW L-380 ISOLATION TRANSFORMER AND L-823 CONNECTORS. CONTRACTOR MUST ENSURE LIGHT LOCATION IS ALIGNED WITH THE RUNWAY EDGE LIGHT ON THE OPPOSITE SIDE OF THE RUNWAY.

KEY MAP



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ELECTRICAL LAYOUT AND CIRCUITING PLAN

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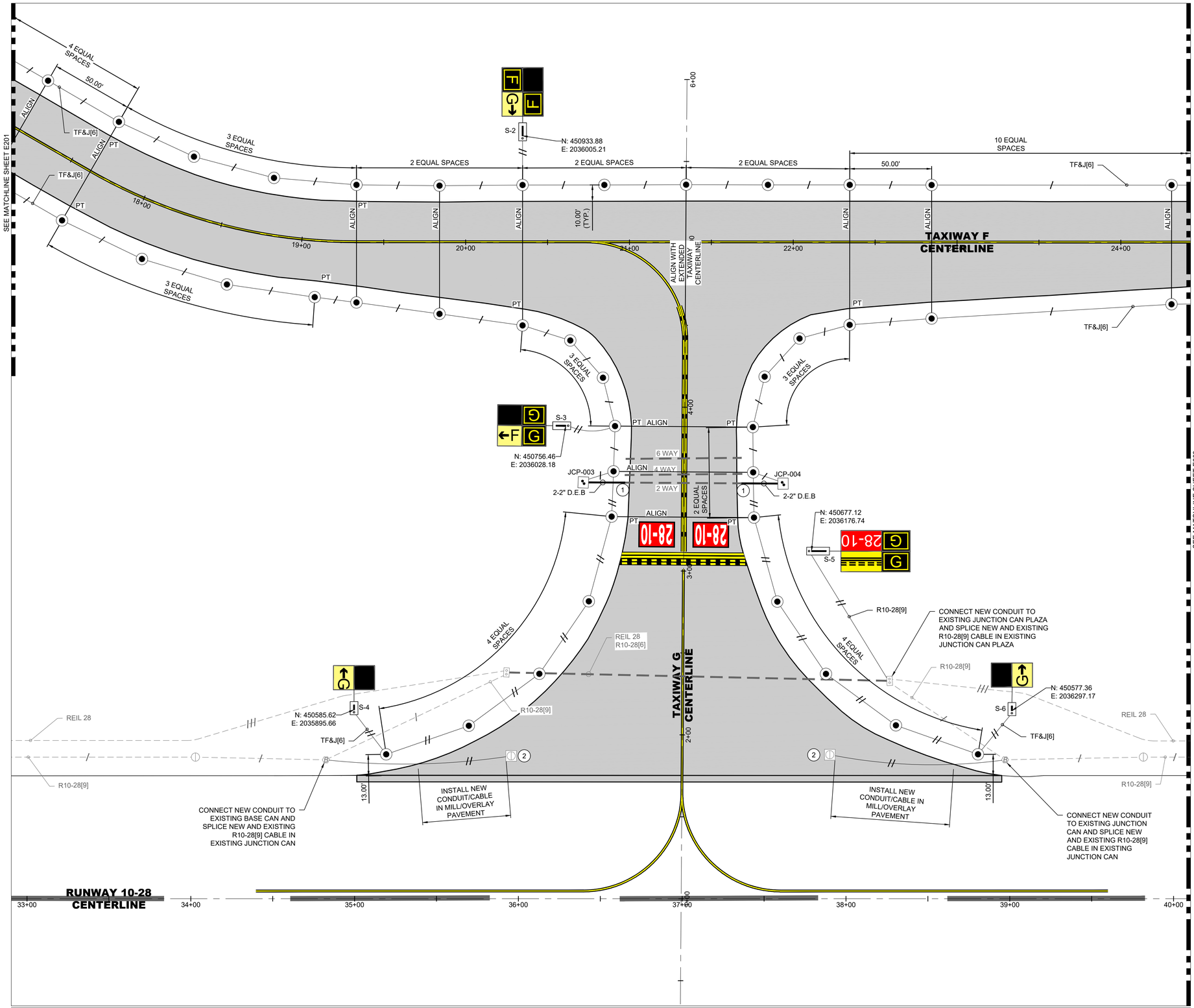

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NEW L-861T(L), OMNIDIRECTIONAL, BLUE, WITH UV RESISTANT POLYCARBONATE LENS, LED, ELEVATED TAXIWAY EDGE LIGHT, COLUMN MOUNTED ON AN L-867B, CLASS 1A, 24" DEEP BASE CAN WITH A "CORTEN" OR APPROVED EQUAL BASE PLATE, PROPERLY SIZED L-830 TRANSFORMER AND L-823 CONNECTORS. THE OVERALL HEIGHT SHALL BE 14", UNLESS OTHERWISE NOTED.

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2-2" D.E.B.
NEW 2 WAY 2" SCH. 40 PVC DIRECT EARTH BURIED DUCT

2-2" D.D.
NEW 2 WAY 2" HDPE DIRECTIONAL DRILL DUCT

TX[#]
NEW 2" SCHEDULE 40 PVC CONDUIT, DIRECT EARTH BURIED IN TURF. NUMBER OF TIC MARKS INDICATES THE NUMBER OF NEW L-824, TYPE C, 5KV, #8 AWG CABLES INSTALLED IN DUCT.
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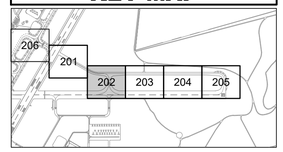

NORTH

30 0 30 60

SCALE (IN FEET)
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REVISIONS

NO.	DATE	ISSUED FOR

FAA NO:	X-XX-XXXX-XXX-XXXX
RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL LAYOUT AND CIRCUITING PLAN

SHEET NUMBER

E202

BIDDING DOCUMENTS

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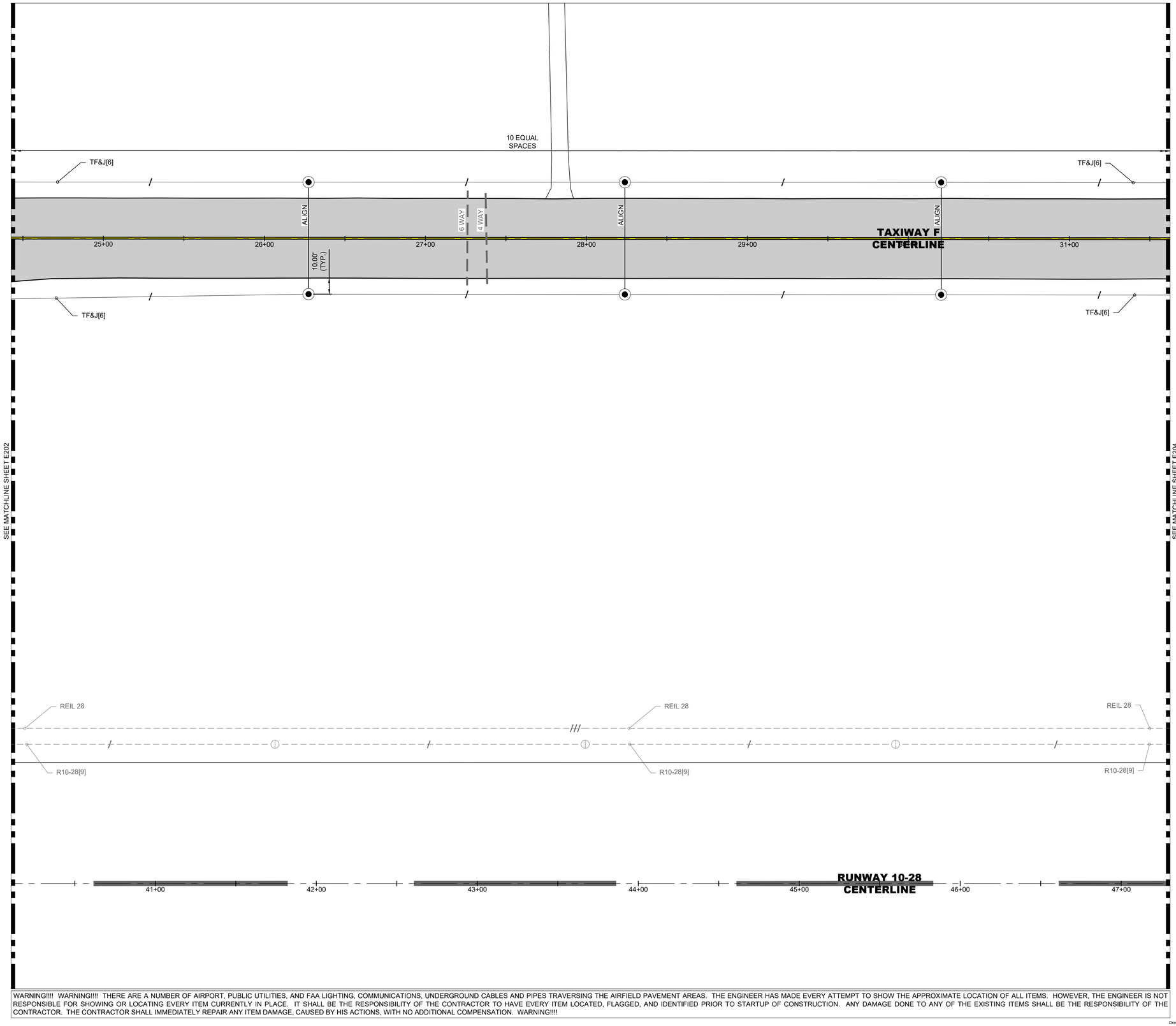

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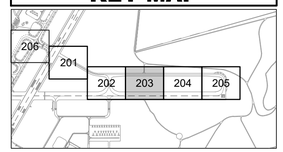

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DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL LAYOUT AND CIRCUITING PLAN

SHEET NUMBER

E203

BIDDING DOCUMENTS

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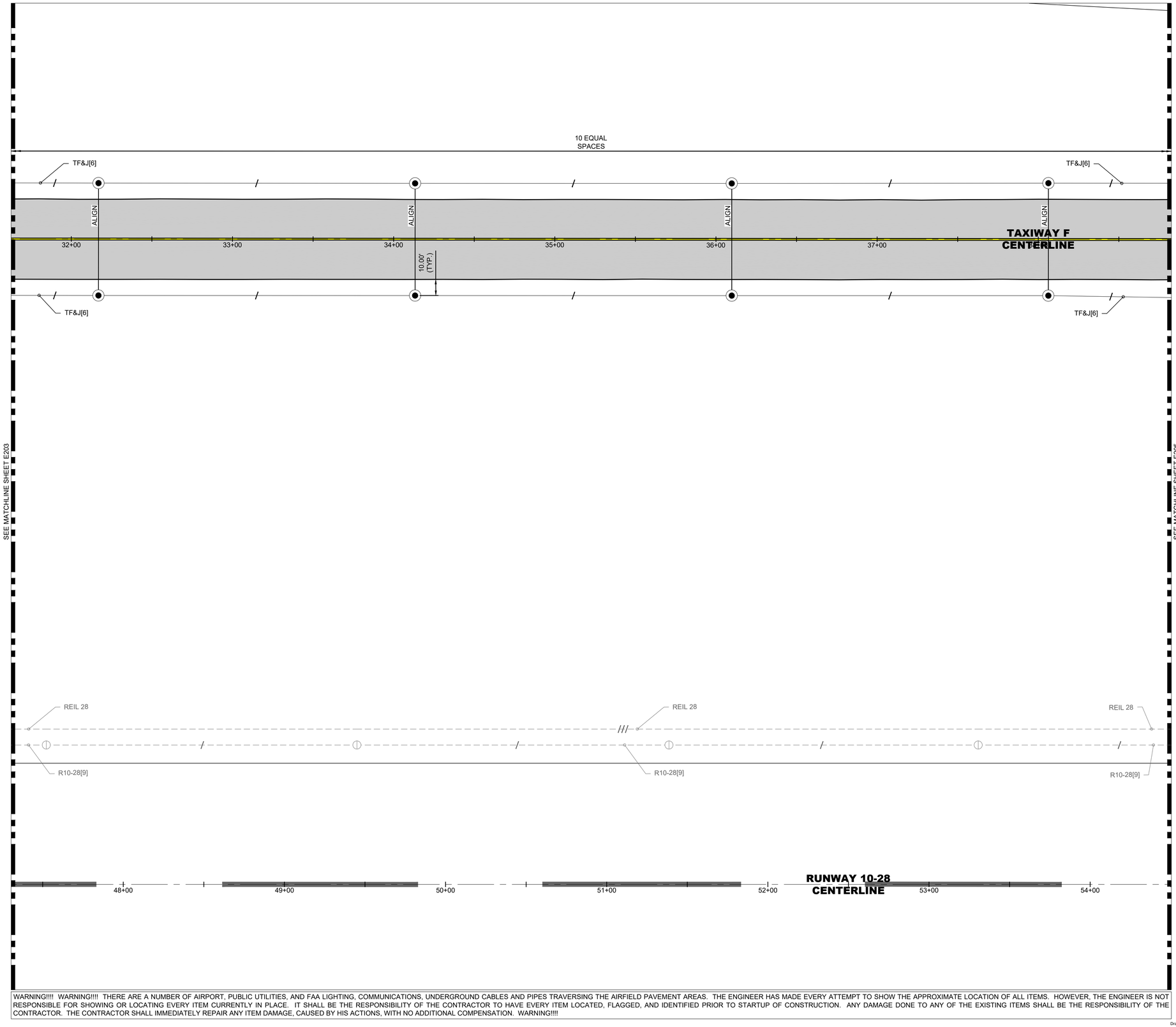

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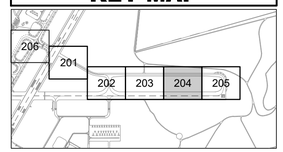

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DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL LAYOUT AND CIRCUITING PLAN

SHEET NUMBER

E204

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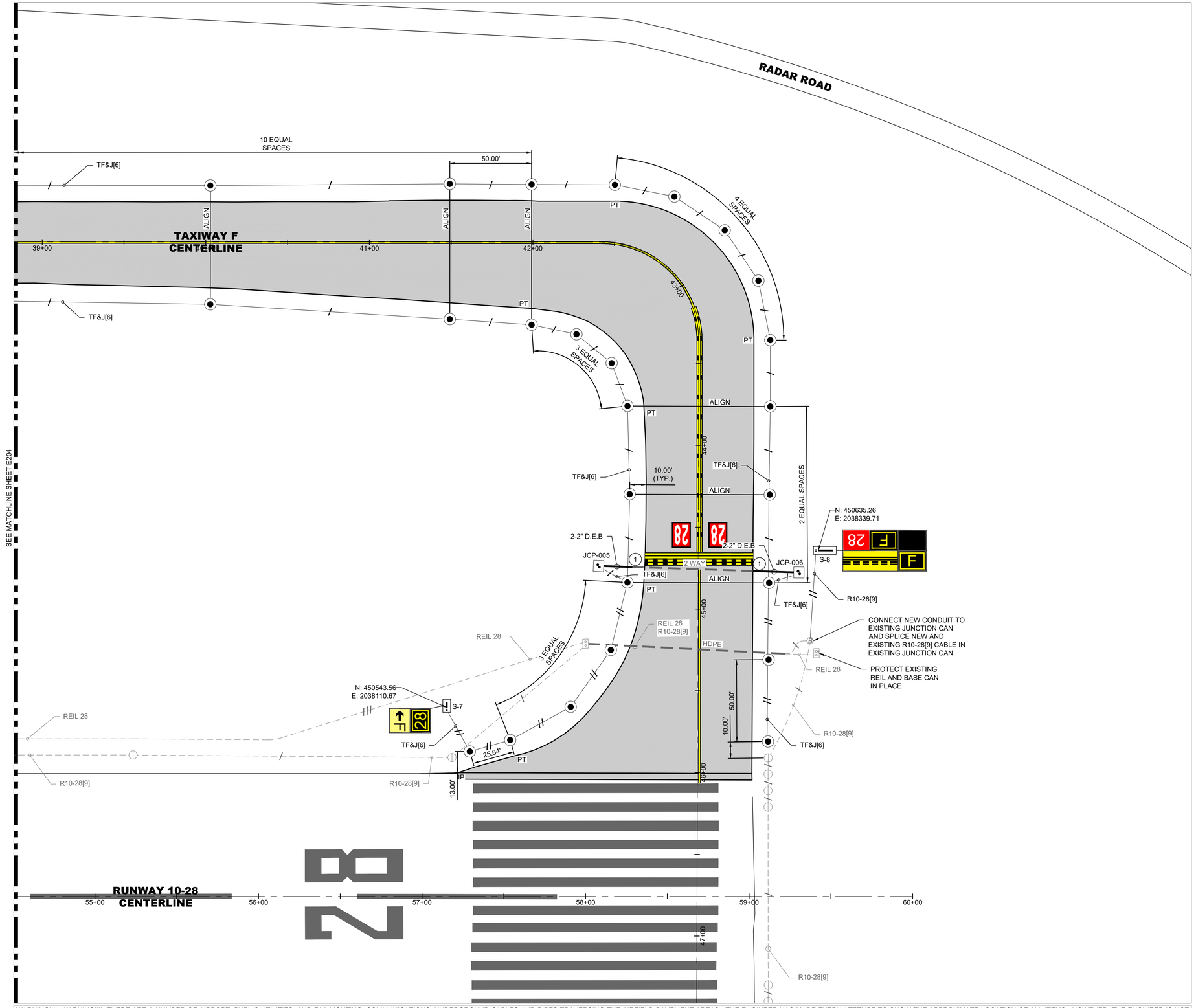

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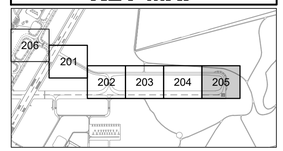

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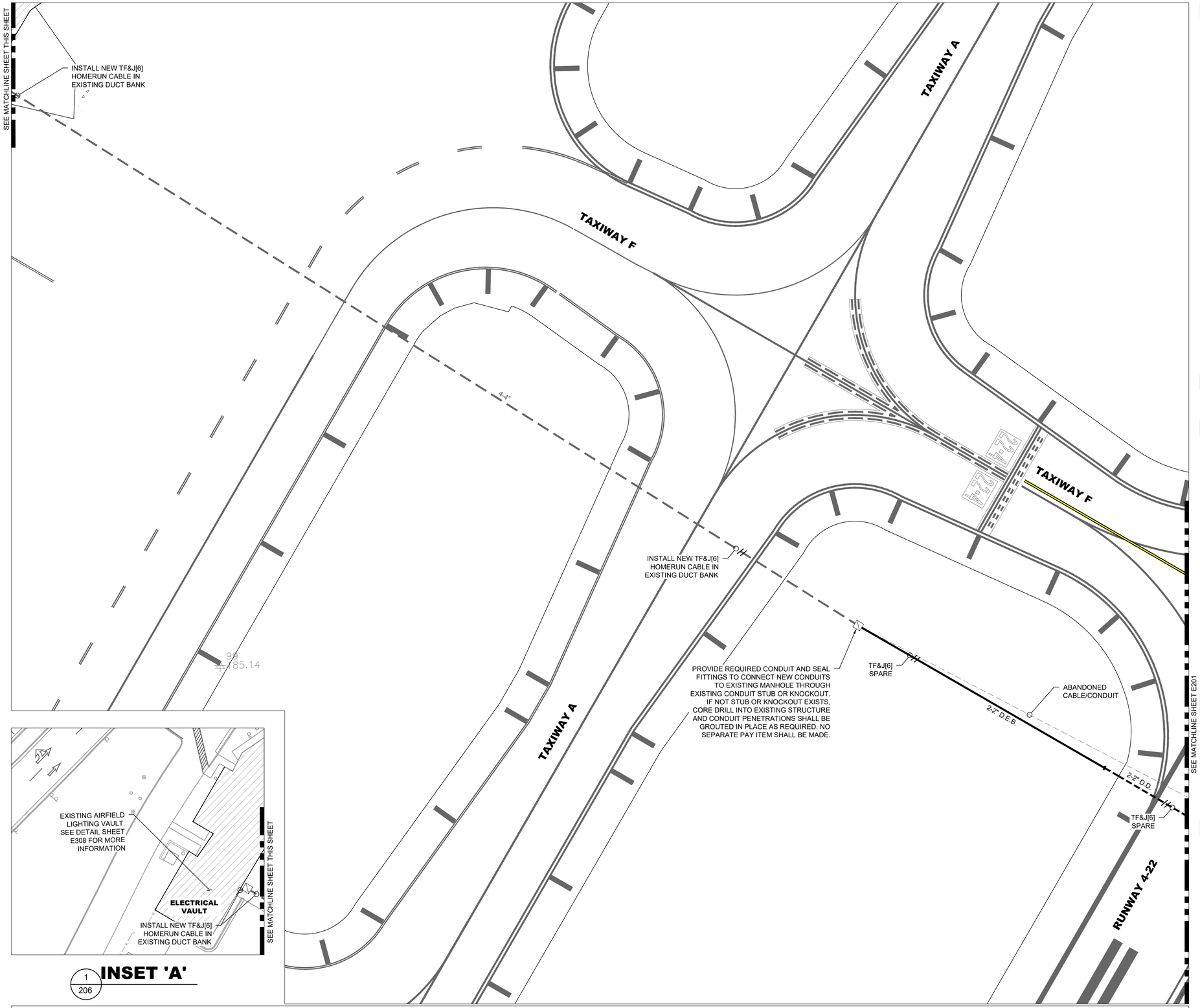

1
206
INSET 'A'

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NEW 2" SCHEDULE 40 PVC CONDUIT, DIRECT EARTH BURIED IN TURF. NUMBER OF TIC MARKS INDICATES THE NUMBER OF NEW L-824, TYPE C, 5KV, #8 AWG CABLES INSTALLED IN DUCT.
TX[#] = CIRCUIT DESIGNATOR

T X [#]
- CCR NUMBER
- X = RUNWAY OR TAXIWAY IDENTIFIER
- T = TAXIWAY
- R = RUNWAY

CIVIL LEGEND

PROPOSED MILL AND OVERLAY

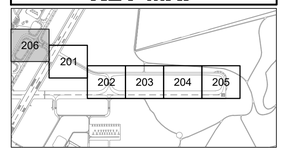
NOTES

1. THE DIMENSIONS SHOWN ARE ESTIMATED. THE CONTRACTOR SHALL SURVEY THE ACTUAL DIMENSIONS AND MODIFY THE LIGHT SPACING AS NEEDED. THE SURVEY MUST INCLUDE ANY NECESSARY INFORMATION SUCH AS, BUT NOT LIMITED TO, EXISTING LIGHT LOCATIONS, PAVEMENT EDGE, PAVEMENT POINTS OF TANGENCY OR INTERSECTION POINTS, OR ANY OTHER FEATURE REQUIRED TO INSTALL LIGHTS PER DIMENSIONS AND FAA AC 150/5340-30 (CURRENT EDITION). THE COST SHALL BE INCIDENTAL TO THE LIGHT AND SIGN INSTALLATIONS.
2. THE CONTRACTOR SHALL SURVEY ALL POINTS OF TANGENCY (PT) AND INTERSECTION POINT (IP) AS SHOWN ON THE PLANS. THE CONTRACTOR MUST PROVIDE THE SURVEYED LOCATIONS TO THE ENGINEER AS A SHOP DRAWING FOR REVIEW. THE CONTRACTOR IS TO STAKE OUT LOCATIONS OF EACH LIGHT PRIOR TO CONSTRUCTION AND CONFIRM WITH THE ENGINEER.
3. CONTRACTOR SHALL FIELD VERIFY EXISTING TAXIWAY EDGE LIGHT LOCATION AND CONFIRM DIMENSION SHOWN PRIOR TO LAYOUT.

KEYNOTES

1. INTERCEPT EXISTING DUCT BANK. PROVIDE APPROPRIATELY SIZED COUPLING AND EXTEND EXISTING DUCT BANK 15' TO NEW JUNCTION CAN PLAZA
2. REINSTALL EXISTING LIGHT FIXTURE ON NEW L-868B BASE CAN AT EXISTING FIXTURE'S SURVEYED LOCATION WITH NEW L-380 ISOLATION TRANSFORMER AND L-823 CONNECTORS. CONTRACTOR MUST ENSURE LIGHT LOCATION IS ALIGNED WITH THE RUNWAY EDGE LIGHT ON THE OPPOSITE SIDE OF THE RUNWAY.

KEY MAP



NORTH

30 0 30 60
SCALE (IN FEET)
1 INCH = 30 FEET (WHEN PRINTED 34"x22")

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SHEET TITLE
ELECTRICAL LAYOUT AND CIRCUITING PLAN

SHEET NUMBER
E206

BIDDING DOCUMENTS

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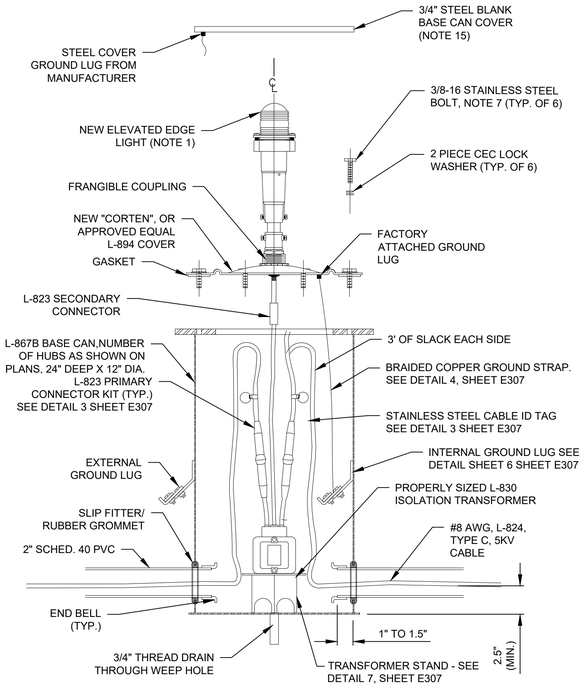
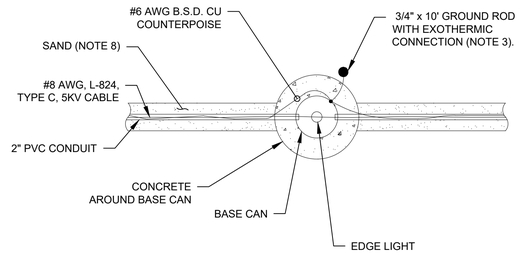


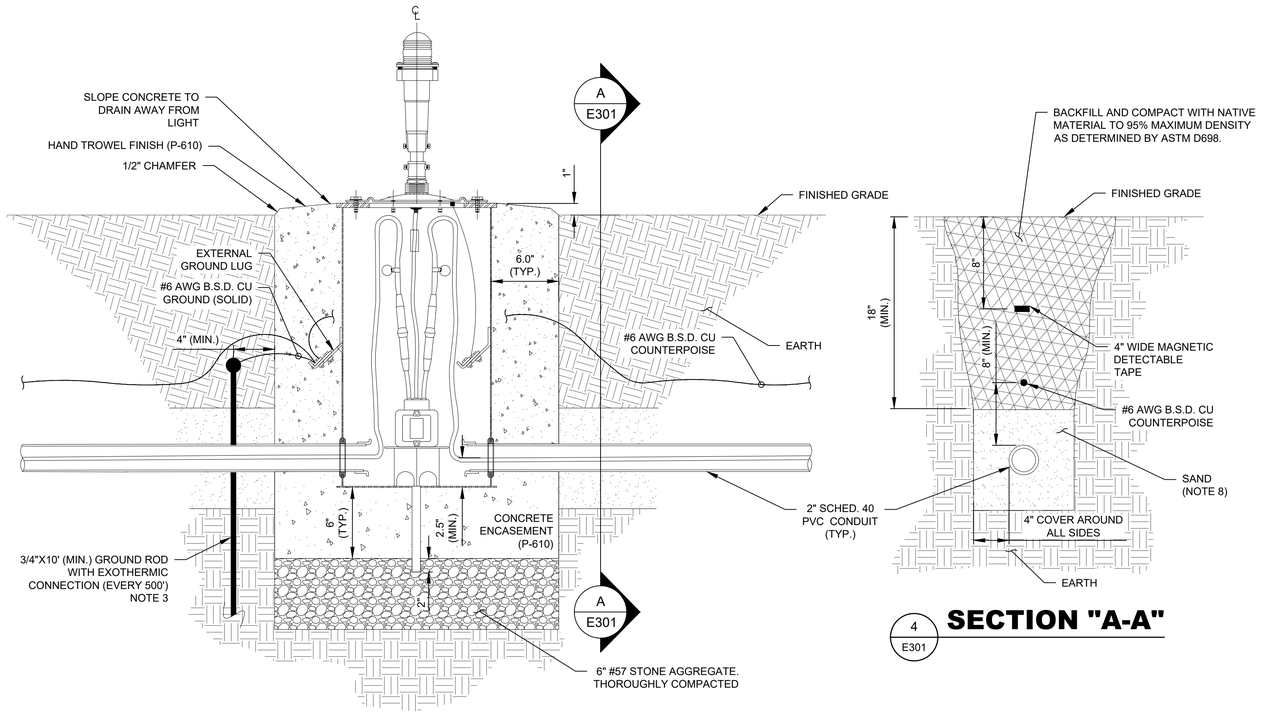
1 E301

ELEVATED EDGE LIGHT



2 E301

MOW PAD AND COUNTERPOISE LAYOUT



3 E301

ELEVATED EDGE LIGHT INSTALLED IN UNPAVED SHOULDER

4 E301

SECTION "A-A"

ELEVATED FIXTURE NOTES:

1. THE OVERALL HEIGHT OF THE ELEVATED EDGE LIGHTS SHALL BE 14".
2. ALL BASE CAN INSTALLATION TECHNIQUES, METHODS, MATERIALS, ETC., SHALL BE SUBMITTED TO THE RPR FOR REVIEW AND APPROVAL PRIOR TO THE START OF WORK.
3. EACH GROUND ROD SHALL MEASURE 25 OHMS OR LESS, PRIOR TO CONNECTION TO THE GROUND SYSTEM. IN THE EVENT 25 OHM VALUE IS NOT MET, AN ADDITIONAL GROUND ROD SHALL BE INSTALLED.
4. ANY BASE CAN DAMAGED DURING CONSTRUCTION SHALL BE REMOVED AND REPLACED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
5. EDGE LIGHTS SHALL BE INSTALLED 10.0' FROM THE EDGE OF FULL STRENGTH PAVEMENT. COUNTERPOISE SHALL BE INSTALLED DIRECTLY ABOVE THE CONDUIT.
6. THE FINISHED PAVEMENT SURFACE SHALL BE PROTECTED FROM FOREIGN SUBSTANCES WHICH COULD CAUSE STAINING, IE. CONCRETE, OIL, ETC. THE CONTRACTOR SHALL IMMEDIATELY CLEAN ALL SPILLS AND CORRECT/CLEAN ANY STAINED SURFACES AT THE CONTRACTOR'S EXPENSE.
7. THE BASE CAN COVER MOUNTING BOLTS SHALL EXTEND THROUGH THE BASE CAN MOUNTING FLANGE INTO THE BASE CAN A MIN. OF 0.5". THE BOLTS SHALL HAVE ENOUGH THREAD LENGTH SO THEY DO NOT SHOULDER OUT BEFORE THE FIXTURE IS SECURELY TIGHTENED. ANTI-SEIZE SHALL BE USED ON BOLTS (NOALOX OR APPROVED EQUAL).
8. USE SAND TO BACKFILL THIS AREA. REMOVED EARTH MAY BE USED PROVIDED NO ROCK OR STONE LARGER THAN 1/4" IS PRESENT. BACKFILL SHALL COMPLY WITH CIVIL SPECIFICATIONS. IF ADDITIONAL SAND BACKFILL IS REQUIRED TO PROPERLY COMPACT THE FILLING OF THE TRENCH TO MATCH ADJACENT NATIVE SOIL CONDITIONS, IT SHALL BE PROVIDED AT NO ADDITIONAL COST AS A PART OF THE TRENCHING LINE ITEM.
9. P-610 CONCRETE AROUND BASE CANS AND DUCT/CONDUIT SHALL BE COMPLETELY CONSOLIDATED BY MECHANICAL MEANS AND SHALL BE FREE OF ANY VOIDS.
10. IMMEDIATELY AFTER THE HOLES ARE AUGURED, THE BASE CANS SHALL BE INSTALLED AND THE P-610 PLACED SO AS TO PREVENT WATER FROM ENTERING THE HOLE.
11. ALL L-824 CABLES SHALL BE IDENTIFIED WITH AN 18 GAUGE STAINLESS STEEL TAG WITH ITS RESPECTIVE CIRCUIT/LOOP NUMBER AT ALL ACCESSIBLE LOCATIONS. ATTACH ID TAG 12" FROM THE L-823 CONNECTORS OR MID LOOP IF NO CONNECTORS ARE REQUIRED. THE CONDUCTORS SHALL BE IDENTIFIED ON EACH SIDE OF THE CONNECTORS OR LOOP.
12. L-823 CONNECTORS SHALL BE INSTALLED ON ALL CABLES, IN EACH, BASE CAN, MANHOLE, OR OTHER ACCESSIBLE LOCATIONS.
13. ALL AIRFIELD LIGHTING MATERIALS SHALL COMPLY WITH FAA SPECIFICATIONS AND REQUIREMENTS.
14. PRE-CAST BASE CANS ARE ACCEPTABLE PROVIDED THEY MEET THE REQUIREMENTS AS SHOWN ON THE DETAIL. THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING FOR APPROVAL.
15. FOR JUNCTION CANS, REPLACE LIGHT FIXTURE WITH 3/4 " STEEL COVER AND REPLACE L-867B BASE CAN WITH L-867D BASE CAN.
16. INSTALLATION OF SCHEDULE 40 PVC CONDUIT STUBOUT SHALL BE INCIDENTAL TO THE "L-861(L) LED ELEVATED RUNWAY EDGE LIGHT - BASE MOUNTED INSTALLED IN TURF" LINE ITEM.

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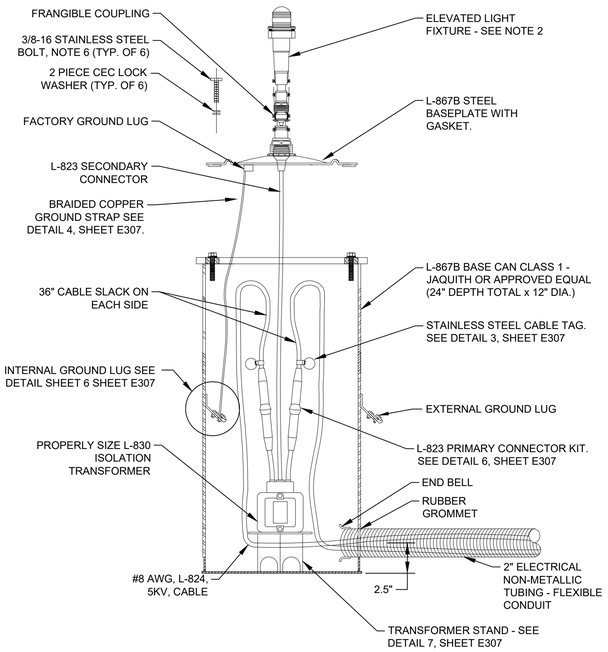
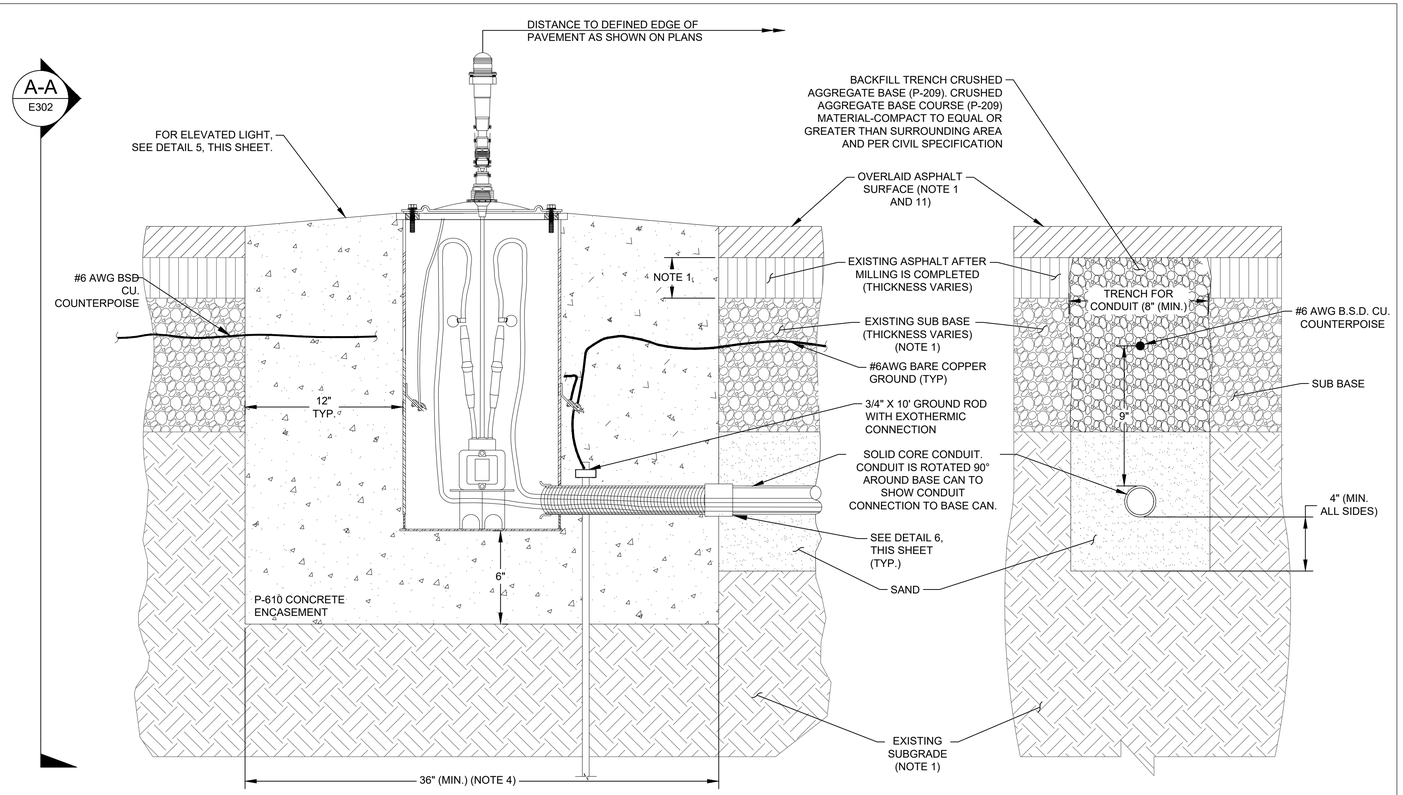


1 E302 **INSTALLATION MATERIALS**

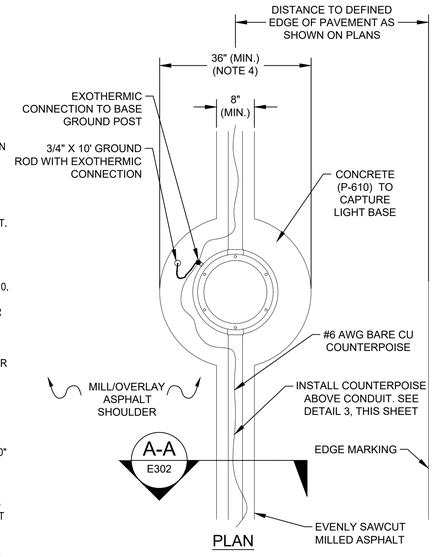


2 E302 **ELEVATED FIXTURE IN MILL-OVERLAY ASPHALT SHOULDER PAVEMENT**

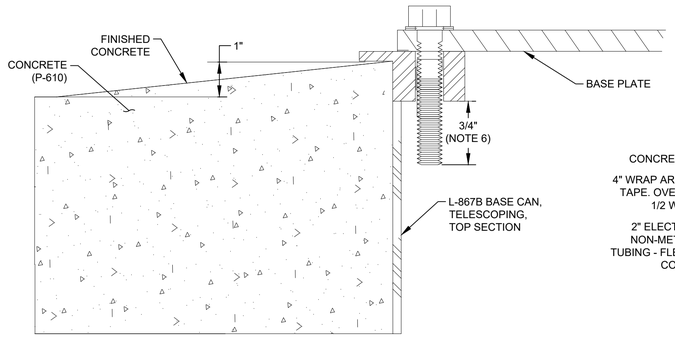
3 E302 **SECTION A-A**

ELEVATED FIXTURE NOTES:

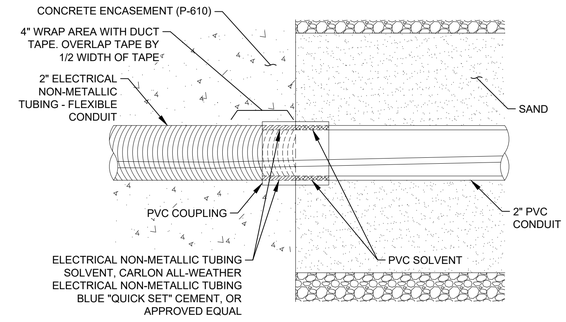
1. SEE CIVIL PLANS FOR TYPICAL PAVEMENT SECTIONS.
2. THE ELEVATED EDGE LIGHTS MUST BE 14" HIGH UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
3. ALL BASE CAN INSTALLATION TECHNIQUES, METHODS, MATERIALS, ETC. MUST BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO THE START OF WORK.
4. A LARGER CORE MAY BE USED IF DESIRED BY THE CONTRACTOR AND APPROVED BY THE RPR/OWNER AT NO ADDITIONAL COST TO THE OWNER.
5. THE FINISHED PAVEMENT SURFACE MUST BE PROTECTED FROM FOREIGN SUBSTANCES WHICH COULD CAUSE STAINING, IE. CONCRETE, OIL, ETC. THE CONTRACTOR MUST IMMEDIATELY CLEAN ALL SPILLS AND CORRECT/CLEAN ANY STAINED SURFACES AT THE CONTRACTOR'S EXPENSE.
6. THE BASE CAN COVER MOUNTING BOLTS MUST EXTEND THRU THE BASE CAN MOUNTING FLANGE INTO THE BASE CAN A MIN. OF 3/4". THE BOLTS MUST BE THREADED BY THE FULL LENGTH OF THE BOLT.
7. CONCRETE (SPECIFICATION P-610) AROUND BASE CANS AND DUCT/CONDUIT MUST BE COMPLETELY CONSOLIDATED BY MECHANICAL MEANS AND MUST BE FREE OF ANY VOIDS. THE CONTRACTOR MUST PROVIDE CONCRETE PER SPECIFICATION P-610.
8. IMMEDIATELY AFTER THE HOLES ARE CORED IN THE PAVEMENT OR BASE COURSE, THE BOTTOM SECTION OF THE BASE CAN MUST BE INSTALLED AND BACKFILLED WITH THE CONCRETE (P-610) TO PREVENT WATER FROM ENTERING THE SUBGRADE. AT NO TIME WILL THE CORE BE LEFT OPEN FOR LONGER THAN ONE EIGHT HOUR WORK PERIOD.
9. FOR BLANK BASE CANS, DELETE LIGHT FIXTURE AND INSTALL 1/2", STEEL COVER AND GASKET.
10. THE CONTRACTOR MUST INSTALL THE LIGHT 10.00-FEET FROM THE EDGE OF THE DEFINED TAXIWAY WITH A TOLERANCE OF +0.00" / -1.0" UNLESS OTHERWISE SHOWN ON PLAN SHEETS. EACH LIGHT FIXTURE MUST BE INDIVIDUALLY SURVEYED BY THE CONTRACTOR TO ENSURE IT IS AS THE CORRECT LOCATION. THE RPR/OWNER WILL INDEPENDENTLY VERIFY THE LIGHT FIXTURE LOCATION DOES NOT EXCEED 10.00-FEET WITH A TOLERANCE OF +0/-1.0". ANY LIGHT FIXTURE LOCATED GREATER THAN 10.00-FEET FROM THE DEFINED EDGE OF THE TAXIWAY OR RUNWAY MUST BE REMOVED AND INSTALLED AT THE CORRECT LOCATION BY THE CONTRACTOR AND AT THE CONTRACTOR EXPENSE. REGARDLESS OF THE LAYOUT DEVIATION DISCOVERED IN THE FIELD AFTER INSTALLATION, THERE WILL BE NO EXCEPTIONS TO THE LIGHT LOCATION TOLERANCE.
11. TEMPORARILY BACKFILL CORED HOLE WITH P-209 CAB PRIOR TO FINAL LIFT OF ASPHALT OVERLAY BEING PLACED.



4 E302 **ELEVATED EDGE LIGHT**



5 E302 **MOUNTING HARDWARE**



6 E302 **PVC TO ELECTRICAL NON-METALLIC TUBING COUPLING**

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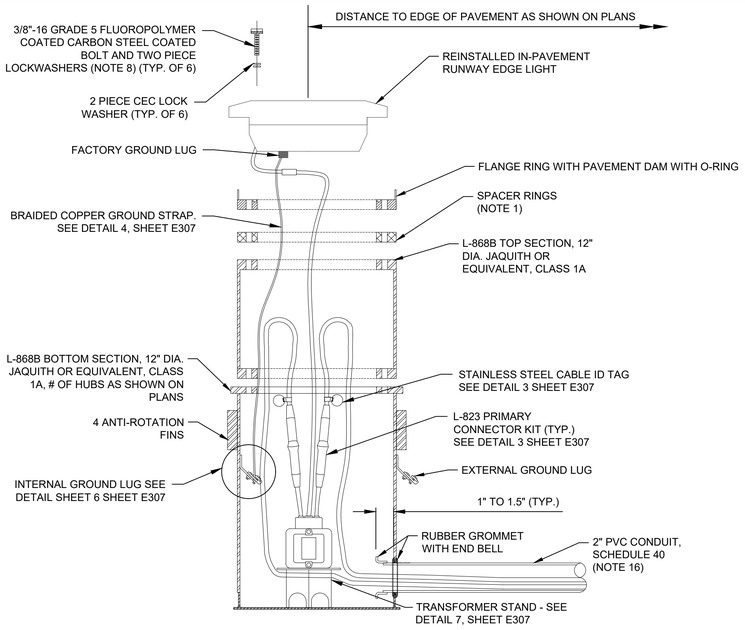
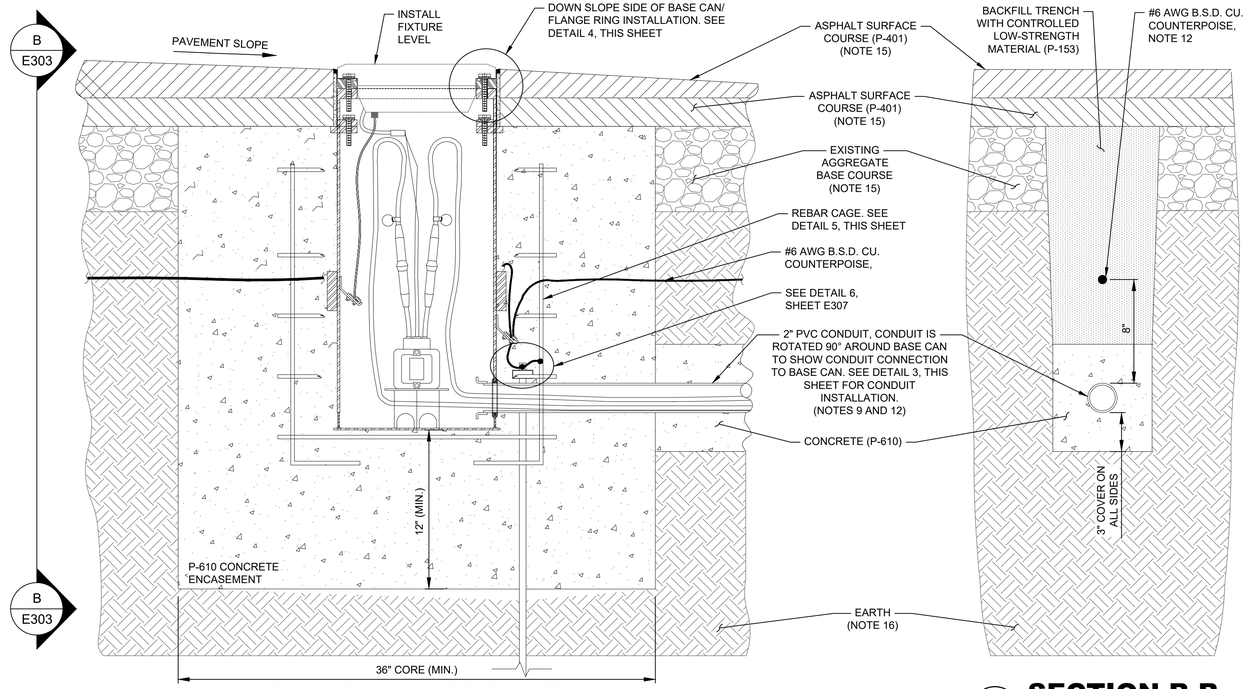


1 E303 **IN-PAVEMENT INSTALLATION MATERIALS**

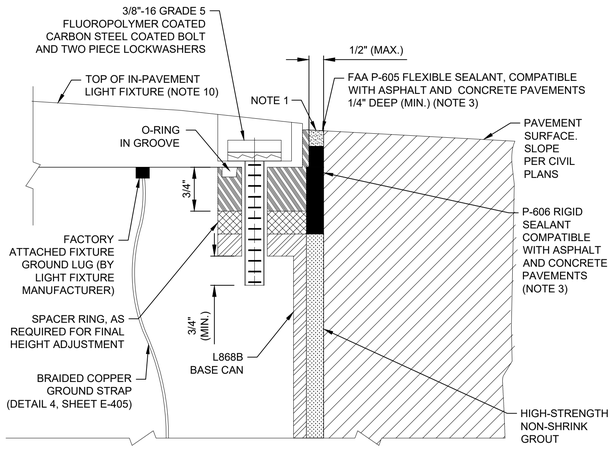


2 E303 **IN-PAVEMENT LIGHT IN FULL STRENGTH ASPALT PAVEMENT**

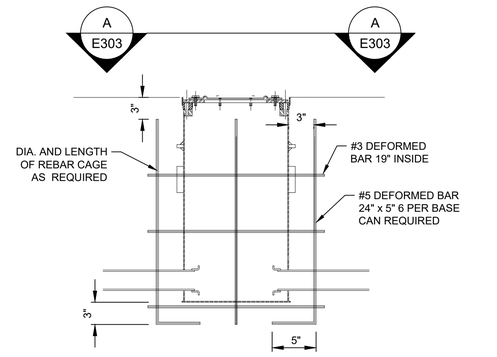
3 E303 **SECTION B-B**

INSET LIGHT BASE CAN NOTES:

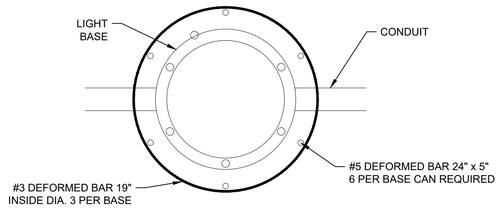
1. THE SPACER RINGS ARE DESIGNED AS A NOMINAL 0.75" THICKNESS (ONE 1/2" SPACER RING WITH CONCRETE RING AND ONE 1/4" SPACER RING). THE SPACER RINGS MAY BE REQUIRED TO BE THINNER OR THICKER DEPENDING ON BASE CAN INSTALLATION AND PAVING TECHNIQUES. THIS CONTRACTOR SHALL BE RESPONSIBLE TO MEASURE AND DETERMINE THE REQUIRED THICKNESS OF EACH INDIVIDUAL SPACER RING, TOP CAN SECTION OR BASE CAN EXTENSION REQUIRED TO PUT THE AIRFIELD LIGHTING FIXTURE AT THE CORRECT ELEVATION, AZIMUTH AND ROTATION PER FAA ADVISORY CIRCULARS, LATEST EDITIONS. THE CONTRACTOR'S BID PRICE SHALL INCLUDE FURNISHING AND INSTALLING ALL SPACER RINGS, TOP CAN SECTIONS AND BASE CAN EXTENSIONS REQUIRED.
2. SINGLE FLAT SPACER RINGS SHALL BE USED FOR HEIGHT ADJUSTMENTS FROM 1/16" TO 1-15/16" IN 1/16" INCREMENTS. A BASE CAN EXTENSION SHALL BE USED FOR HEIGHT ADJUSTMENTS OF 2" AND GREATER. A MAXIMUM OF 2 SPACERS MAY BE USED BETWEEN BOLTED CAN EXTENSIONS, OR THE BASE CAN AND FIXTURE.
3. THE P-605 OR P-606 SEALER SHALL FILL THE VOID TO WITHIN 0.125" OF THE TOP EDGE OF THE CONCRETE RING AT THE LOWEST POINT OF THE CONCRETE RING. ANY OVER POURS SHALL BE IMMEDIATELY AND THOROUGHLY CLEANED TO THE SATISFACTION OF THE OWNER, RPR, AND ENGINEER, AND REPOURED BY AND AT THE CONTRACTOR'S EXPENSE.
4. ALL BASE CAN INSTALLATION TECHNIQUES, METHODS, MATERIALS, ETC. SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE START OF WORK.
5. IMMEDIATELY AFTER THE HOLES ARE CORED IN THE PAVEMENT OR BASE COURSE, THE BASE CANS SHALL BE INSTALLED AND THE P-610 PLACED SO AS TO PREVENT WATER FROM ENTERING THE SUBGRADE.
6. BEFORE PAVING MAY PROCEED THE CONTRACTOR SHALL DEMONSTRATE TO THE RESIDENT ENGINEER THAT THE BASE CANS ARE AT THE CORRECT LOCATION, ELEVATION, AZIMUTH AND ROTATION AND THAT THE PROPER CLEARANCE EXISTS BETWEEN THE BASE CAN AND THE PAVING TRAIN.
7. THE FINISHED PAVEMENT SURFACE SHALL BE PROTECTED FROM FOREIGN SUBSTANCES WHICH COULD CAUSE STAINING, IE. OIL, P-605, ETC. THE CONTRACTOR SHALL IMMEDIATELY CLEAN ALL SPILLS AND CORRECT/CLEAN ANY STAINED SURFACES AT THE CONTRACTORS EXPENSE.
8. INSTALL FIXTURE WITH BOLTS AND LOCK WASHERS AS SHOWN ON DETAIL 4, THIS SHEET, TORQUED TO MANUFACTURER'S RECOMMENDATION. THE FIXTURE MOUNTING BOLTS SHALL EXTEND THRU THE BASE CAN MOUNTING FLANGE INTO THE BASE CAN A MIN. OF 3/4". THE BOLTS SHALL HAVE ENOUGH THREAD LENGTH SO THEY DO NOT SHOULDER OUT BEFORE THE FIXTURE IS SECURELY TIGHTENED.
9. P-610 CONCRETE AROUND BASE CANS AND DUCT/CONDUIT SHALL BE COMPLETELY CONSOLIDATED BY MECHANICAL MEANS AND SHALL BE FREE OF ANY VOIDS.
10. ALL IN-PAVEMENT FIXTURES SHALL BE CLASS 2 (BASE CAN MOUNTED), MODE 1 (CURRENT-DRIVEN), AND STYLE 3 (LOW PROFILE, 0.25" OR LESS).
11. REFER TO CIVIL DRAWINGS FOR ACTUAL JOINT LAYOUTS, DRAINAGE, PAVING DETAILS, ETC. CIVIL DATA IS SHOWN ON ELECTRICAL DRAWINGS FOR REFERENCE ONLY.
12. IN NEW OR EXISTING PAVEMENT ALL CONDUITS, DUCT BANKS, BASE CANS, COUNTERPOISE, GROUND GRID CONDUCTORS, ETC., SHALL BE INSTALLED PRIOR TO PLACEMENT OF THE FINAL LIFT OF PAVEMENT.
13. CONFLICTS THAT MAY OCCUR DUE TO CHANGES IN THE JOINT LAYOUT OR THE LIGHTS, SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.
14. IF A LIGHT CAN IS INSTALLED INCORRECTLY, THE DUCT/CONDUIT IS PLUGGED/BROKEN, OR THE LIGHT CAN IS DAMAGED BY THE CONSTRUCTION ACTIVITIES, THE PAVEMENT AROUND THE LIGHT CAN AND THE LIGHT SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS' EXPENSE.
15. SEE CIVIL PLANS FOR TYPICAL PAVEMENT SECTIONS.
16. PRIOR TO INSTALLING ASPHALT PAVEMENT, THE CONTRACTOR SHALL MANDREL THE CONDUIT AND INSTALL PULL STRING TO ENSURE CONTINUITY OF THE CONDUIT.



4 E303 **MOUNTING HARDWARE**



5 E303 **REBAR DETAIL FOR ALL L-868B BASE CANS**



6 E303 **PLAN SECTION A-A**

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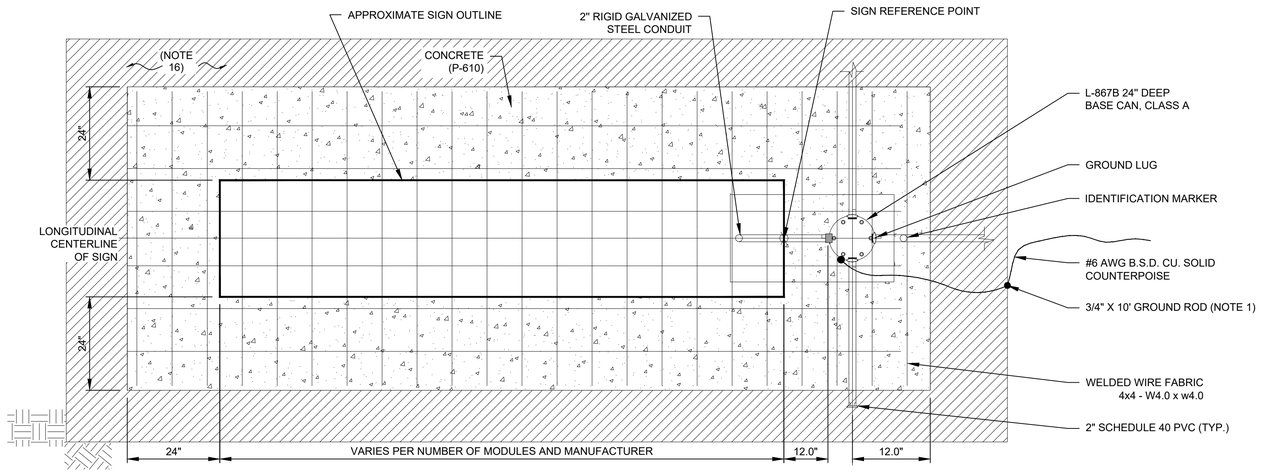
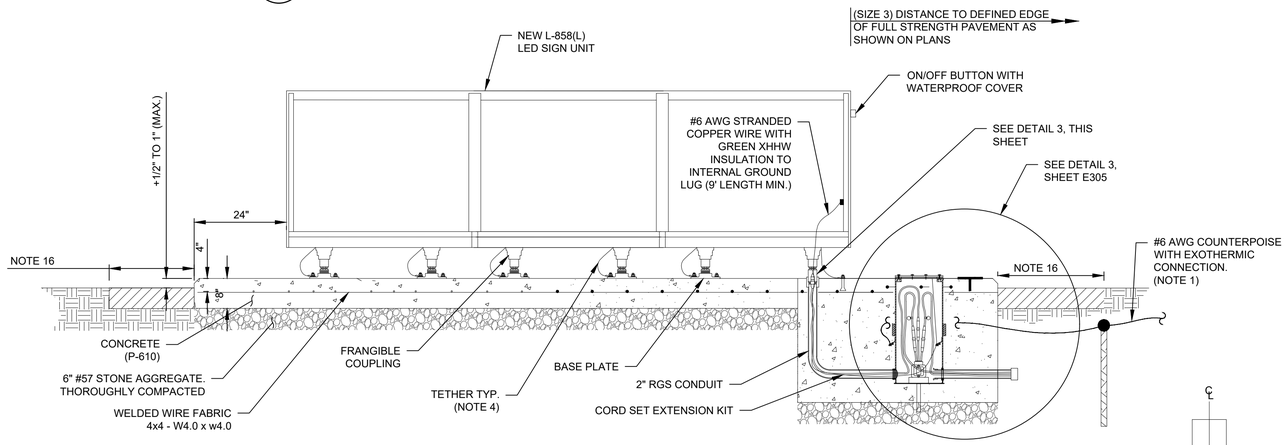
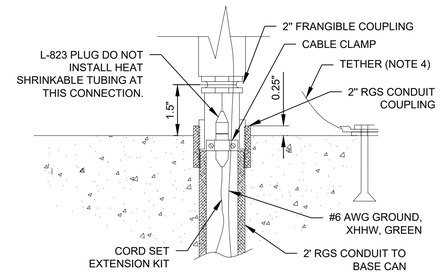


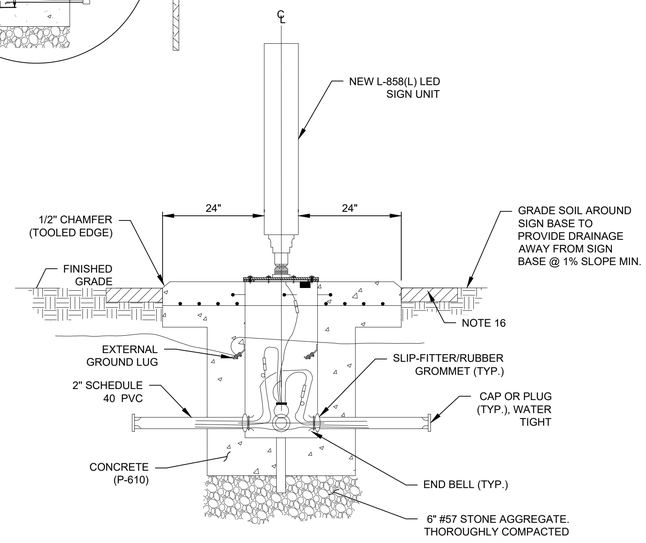
1 E304 SIGN DETAIL - PLAN VIEW



2 E304 SIGN DETAIL - FRONT VIEW



3 E304 FRANGIBLE POWER CONNECTION



4 E304 SIGN DETAIL - SIDE VIEW

NOTES:

1. CONNECTIONS BETWEEN COUNTERPOISE AND GROUND ROD SHALL BE EXOTHERMIC.
2. THE DETAILS SHOWN IN THE PLANS PROVIDE THE MINIMUM REQUIREMENTS FOR SIGN INSTALLATIONS. THE CONTRACTOR SHALL USE STANDARDS APPLICABLE FOR THE PARTICULAR SIGN MANUFACTURER. THE BOLTING PATTERN, METHOD OF ANCHORING, ETC., SHALL BE PER SIGN MANUFACTURER'S RECOMMENDATIONS AND APPROVED BY THE ENGINEER.
3. THE SIGN SHALL WITHSTAND 300 MPH WIND LOAD PER AC 150/5345-44 (LATEST EDITION) WITHOUT DAMAGE. THE SIGN SHALL NOT BREAK AT THE FRANGIBLE POINTS NOR SUFFER PERMANENT DISTORTION. THE SIGN MANUFACTURER SHALL SUBMIT TO THE ENGINEER MOUNTING METHODS AND THE CALCULATIONS OR TEST RESULTS SUPPORTING THE ABOVE REQUIREMENT. THE SIGNS SHALL BE FRANGIBLE, MEETING THE REQUIREMENTS OF AC 150/5345-44 AND AC 150/5340-18 (LATEST EDITIONS).
4. ALL SIGNS SHALL BE FURNISHED WITH TETHERS. TETHERS SHALL BE 3/16" STAINLESS STEEL AIRCRAFT CABLE WITH A FORMED EYE ON BOTH ENDS. THE TETHER EYE SHALL BE ATTACHED TO THE SIGN AND BASE BY BEING SANDWICHED BETWEEN TWO STAINLESS STEEL FENDER WASHERS, WITH A 1/2" MINIMUM STAINLESS STEEL BOLT. THE TETHER SHALL BE OF SUFFICIENT LENGTH TO HAVE A MINIMUM OF 6" OF SLACK WHEN ATTACHED BETWEEN THE SIGN AND THE SIGN BASE. THE TETHERS AND BONDING CONDUCTORS SHALL BE OF SUFFICIENT LENGTH TO ALLOW THE FRANGIBLE COUPLINGS TO OPERATE WITHOUT RESTRICTIONS AND TO ALLOW THE POWER CABLE TO DISCONNECT IF THE SIGN FALLS OVER. ALL TETHERS SHALL BE THE SAME LENGTH. PROVIDE 1 TETHER PER SIGN LEG. THE BONDING CONDUCTOR AND SIGN TETHER SHALL NOT BE ATTACHED AT THE SAME ANCHOR BOLT. AN APPROVED MECHANICAL OR COMPRESSION LUG SHALL BE USED TO CONNECT THE BONDING CONDUCTOR TO THE SIGN FLANGE AND SIGN.
5. FOR LOCATION AND ORIENTATION OF SIGNS AND FOUNDATIONS, SEE LAYOUT PLANS. THE LOCATION SHOWN ON THE PLANS IS THE PERPENDICULAR DISTANCE FROM THE DEFINED TAXIWAY EDGE OF FULL STRENGTH PAVEMENT, TO THE NEAR SIDE OF THE SIGN ON THE SIGN'S LONGITUDINAL CENTERLINE (SEE PLAN VIEW).
6. ALL SIGNS SHALL BE ORIENTED SUCH THAT THE LONGITUDINAL CENTERLINE OF THE SIGN IS PERPENDICULAR TO THE RESPECTIVE TAXIWAY CENTERLINE, UNLESS NOTED OTHERWISE.
7. ALL MANDATORY SIGNS SHALL BE LOCATED OFF THE EDGE OF FULL STRENGTH PAVEMENT AND ALIGNED WITH THE FRONT EDGE OF THE FRONT STRIPE OF THE HOLD POSITION MARKING. ALL TAXIWAY GUIDANCE SIGNS SHALL BE LOCATED OFF THE EDGE OF THE FULL STRENGTH PAVEMENT AS SHOWN ON THE PLANS.
8. THE ACTUAL SIGN DIMENSIONS WILL VARY. THE BASE SIZE AS SHOWN SHALL BE ADJUSTED TO MATCH THE SIGN.
9. THE CONCRETE SHALL COMPLY WITH P-610 SPECIFICATION.
10. CONCRETE STEEL REINFORCEMENT SHALL BE TYPE ASTM A615 GRADE 60. ALL REINFORCEMENT SHALL HAVE A 3" MINIMUM CONCRETE COVER. REINFORCEMENTS MAY BE ADJUSTED TO MISS INTERFERENCES.
11. INSTALL SIGN UNIT LEVEL. USE STRUCTURAL BACKFILL AS REQUIRED. STRUCTURAL BACKFILL, FREE-DRAINING, AS APPROVED BY THE ENGINEER, SHALL BE PLACED IN HORIZONTAL LIFTS NOT TO EXCEED 4".
12. ALL AREAS FOR THE LEG FLANGE PLATES SHALL BE IN THE SAME PLANE. THE ANCHOR BOLTS SHALL BE A-36 STEEL, HOT DIP GALVANIZED WHEN CAST INTEGRALLY WITH THE CONCRETE PAD OR STAINLESS STEEL EXPANSION ANCHORS.
13. RESTORATION OF GRADE IN DISTURBED AREAS SHALL BE INCIDENTAL TO THE SIGN INSTALLATION.
14. GROUND RODS SHALL BE 3/4 INCH DIAMETER, 10 FEET LONG, COPPER CLAD STEEL SECTIONAL RODS. EACH GROUND ROD SHALL BE INDIVIDUALLY TESTED PRIOR TO CONNECTION TO THE GROUND GRID OR COUNTERPOISE. EACH INDIVIDUAL ROD SHALL HAVE AN EARTH RESISTANCE OF 25 OHMS OR LESS. IN THE EVENT 25 OHM VALUE IS NOT MET, AN ADDITIONAL GROUND ROD SHALL BE INSTALLED.
15. SIGNS SHALL BE WELL SEALED AGAINST INFILTRATION BY WATER AND DIRT.
16. ISOLATION TRANSFORMER BRICK STAND SHALL BE INSTALLED SUCH THAT IT DOES NOT BLOCK 3/4" DRAINAGE WEEP HOLE
17. SODDING OF DISTURBED AREAS SHALL BE INCLUDED IN THE INDIVIDUAL SIGN PAY ITEM AND SHALL BE 60" MIN. AROUND CONCRETE PAD. GRASS SOD SHALL BE NATIVE TO WORK AREA.

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FAA NO:	X-XX-XXXX-XXX-XXXX
RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

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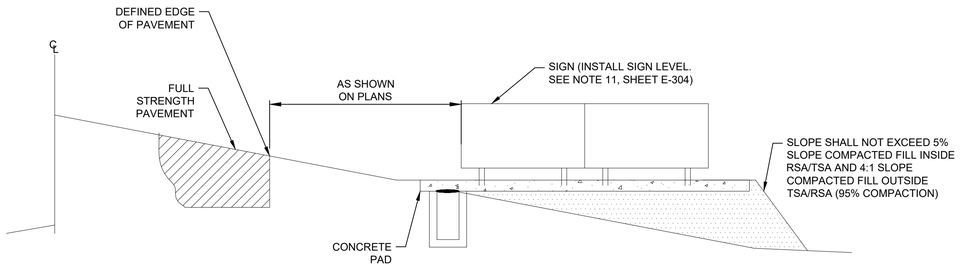
SIGN SCHEDULE - INSTALL NEW SIGN ON NEW FOUNDATION													
SIGN NO.	LEGEND - SIDE A				LEGEND - SIDE B				SIZE	STYLE	MODE	CLASS	NOTES
	1	2	3	4	1	2	3	4					
S-1	F	4-	22				F		3	3	3	1	
	L	R	R		Y	Y	L						
S-2	F	G ➔			F				3	2	3	1	
	L	Y			L	BLANK							
S-3	← F	G			G				3	2	3	1	
	Y	L			L	BLANK							
S-4	← G								3	2	3	1	
	Y				BLANK								
S-5	G	28	-1	0				G	3	3	3	1	
	L	R	R	R	Y	Y	Y	L					
S-6					G ➔				3	2	3	1	
	BLANK				Y								
S-7	← F				28				3	2	3	1	
	Y				L								
S-8		F	28				F		3	3	3	1	
	BLANK	L	R		Y	Y	L						

LEGEND:

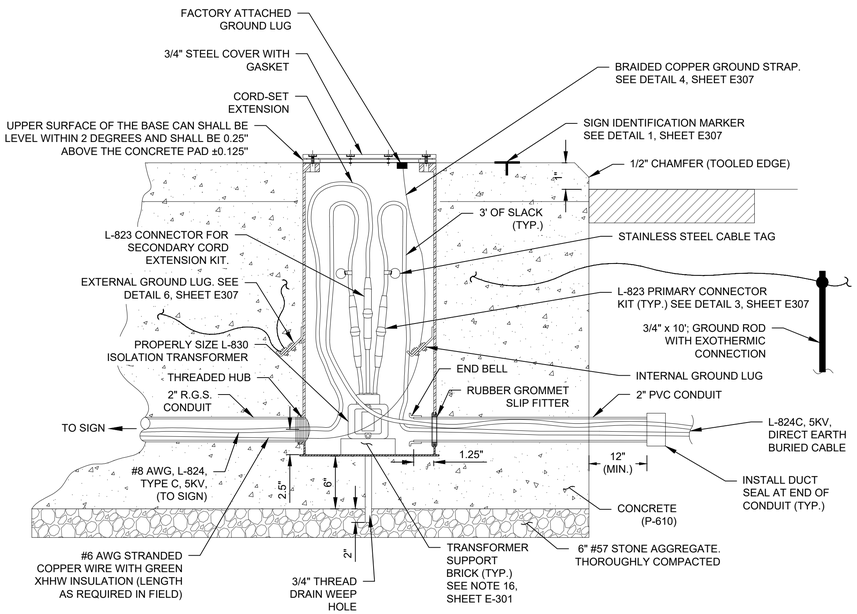
SIDE B ⟵ END TOWARD
SIDE A T/W OR R/W

TYPE DESIGNATIONS
L = L-858(L)L LOCATION SIGN
Y = L-858(L)Y DIRECTION OR BOUNDARY SIGN
R = L-858(L)R MANDATORY INSTRUCTION SIGN
B = L-858(L)B RUNWAY DISTANCE REMAINING SIGN
BLANK = SIGN PANEL WITHOUT INSCRIPTION; BLANK PANEL
EX = EXISTING PANEL

1 E305 **SIGN SCHEDULE**



2 E305 **GRADING AND FILL DETAIL**



3 E305 **SIGN BASE CAN**

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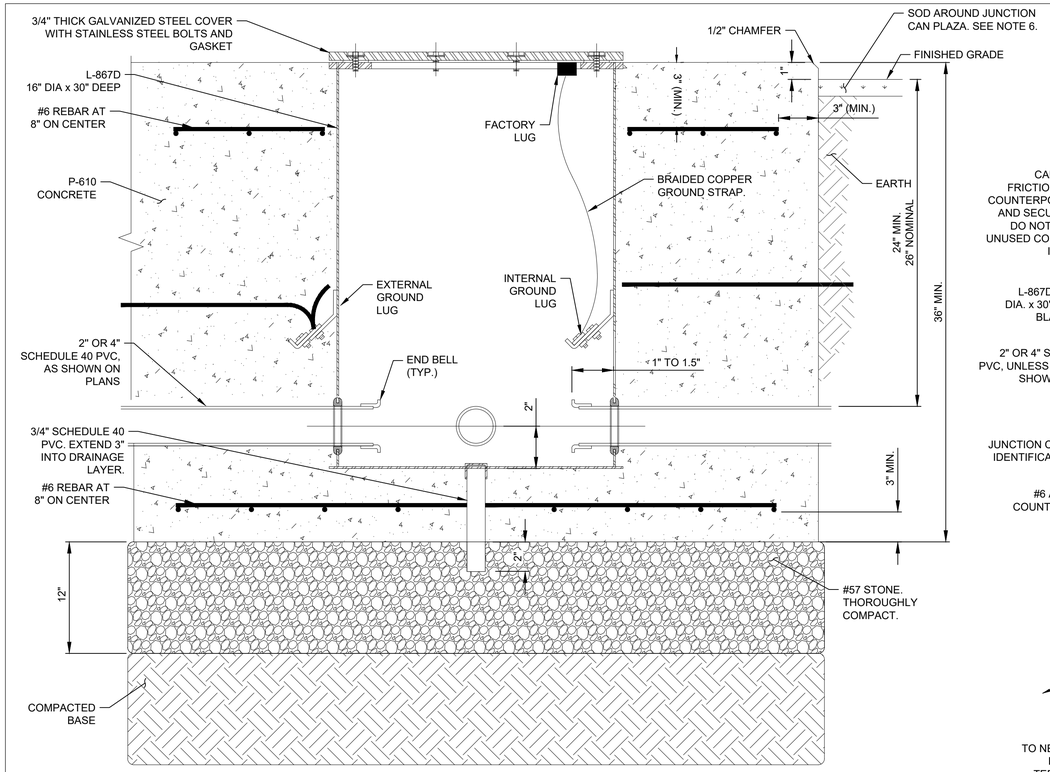
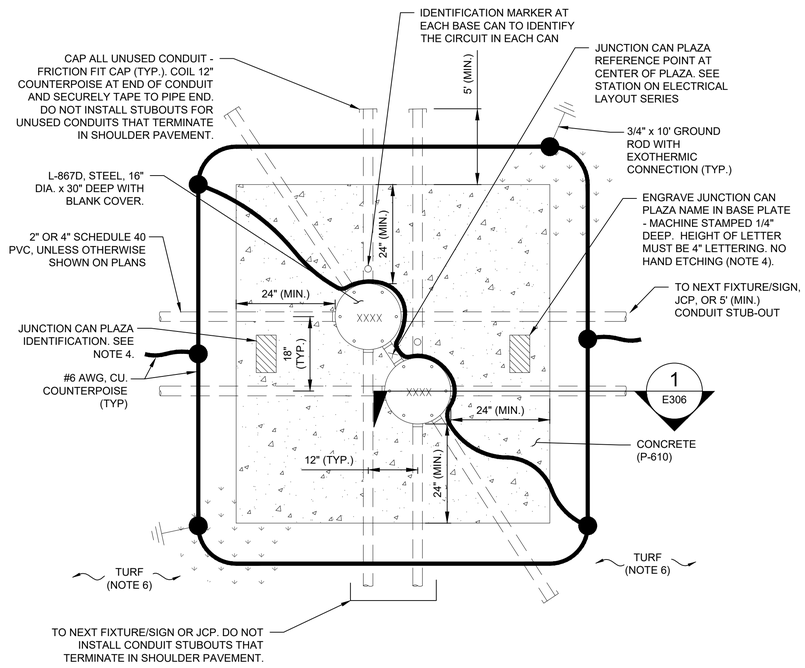
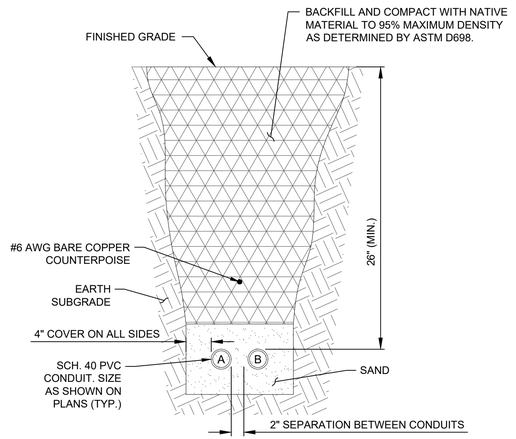


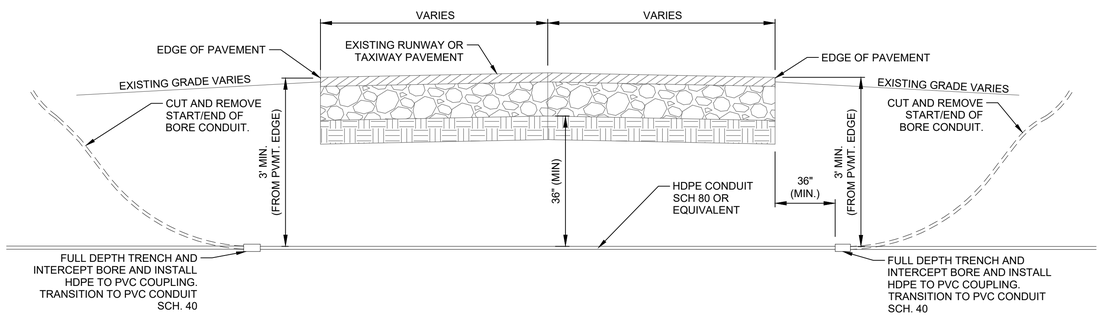
1 E306 TYPICAL BASE CAN SECTION (FOR JUNCTION CAN PLAZA)



2 E306 2 WAY JUNCTION CAN PLAZA



3 E306 2 WAY DUCT SECTION IN TURF



4 E306 DIRECTIONAL DRILL DETAIL

JUNCTION CAN NOTES:

1. NUMBER OF JUNCTION CANS AND CONDUIT CONFIGURATIONS VARY. SEE LAYOUT PLAN SHEETS FOR ORIENTATION. MODIFY OVERALL PAD SIZE TO ACCOMMODATE THE QUANTITY OF JUNCTION CANS SHOWN IN THE PLANS.
2. ORIENT PLAZA AS SHOWN ON AIRFIELD CIRCUITING PLAN SHEETS.
3. INSTALL GROUND RODS AND GROUND LOOP AT ALL JUNCTION CAN PLAZAS AS SHOWN. TWO GROUND RODS PER PLAZA LOCATED AT OPPOSITE CORNERS MUST BE PROVIDED. EACH GROUND ROD MUST BE INDIVIDUALLY TESTED PRIOR TO CONNECTION TO THE GROUND GRID OR COUNTERPOISE. EACH INDIVIDUAL ROD MUST HAVE AN EARTH RESISTANCE OF 25 OHMS OR LESS. OR AN ADDITIONAL SUPPLEMENTAL GROUND ROD MUST BE DRIVEN PER SPECIFICATION L-108 AND PAID FOR UNDER THE L-108 "SUPPLEMENTAL GROUND ROD" PAY ITEM.
4. LABEL TWO (2) ENDS OF EACH JUNCTION CAN PLAZA (JCP) BY IMPRESSING THE JCP IDENTIFICATION NUMBER INTO THE CONCRETE FOUNDATION DURING PLACEMENT. LETTERS AND NUMBERS MUST BE 4" IN HEIGHT, PROPORTIONAL IN WIDTH, AND HAVE A STROKE WIDTH OF 1/2" AND 1/4" DEPTH.
5. SEE AIRFIELD CIRCUITING PLAN SHEETS FOR JCP IDENTIFICATION NUMBERS.
6. GRADE AROUND JUNCTION CAN PLAZAS AS NECESSARY TO PREVENT SILT/DIRT INFILTRATION ONTO JUNCTION CAN PLAZAS. 5' MINIMUM SODDING OF DISTURBED AREAS SHALL BE INCLUDED IN THE INDIVIDUAL JUNCTION CAN PLAZA PAY ITEM. EXCAVATION, GRADING, FILL, SOD, ECT. FOR JUNCTION CAN PLAZAS IS INCIDENTAL TO THE RESPECTIVE JUNCTION CAN PLAZA PAY ITEM.
7. LEAVE APPROXIMATELY 8' OF EACH CABLE COILED IN JUNCTION CAN SO THAT EACH CABLE MAY BE RAISED A MINIMUM OF 3' ABOVE TOP OF CAN.
8. PROVIDE CABLE CIRCUIT IDENTIFICATION MARKERS ATTACHED TO EACH CABLE IN JUNCTION CANS. SEE CABLE IDENTIFICATION REQUIREMENTS.
9. TRANSITION FROM MULTI-WAY CONDUIT TRENCH TO JUNCTION CAN PLAZAS REQUIRES DISTRIBUTION OF 2" OR 4" SCH 40 PVC TO EACH JUNCTION CAN. CONTRACTOR MUST LIMIT CONDUIT BENDS TO 30 DEGREES MAXIMUM.
10. CONDUITS CONNECTING BETWEEN CANS IN THE JUNCTION CAN PLAZA ARE FOR MAINTENANCE AND FUTURE USE ONLY. CONTRACTOR MUST USE CARE NOT TO TRANSPOSE CONDUITS WHEN INSTALLING AND CONNECTING DUCT BANKS.
11. FOR JUNCTION CAN PLAZAS NOT INSTALLED FLUSH WITH ASPHALT SHOULDER PAVEMENT, SEE LAYOUT PLANS FOR STATION AND OFFSET INFORMATION. ROUTE GROUND LOOP AROUND ENTIRE PLAZA, DELETE EXPANSION JOINT, AND INSTALL SOD AROUND PERIMETER OF PLAZA PER NOTE 6, THIS SHEET.
12. THE FINISHED CONCRETE OF THE JUNCTION CAN PLAZAS SHALL BE PAINTED FEDERAL STANDARD 595, INTERNATIONAL ORANGE, COLOR CODE 12197.

DIRECTIONAL DRILL NOTES:

1. THE CONTRACTOR FOR DIRECTIONAL DRILL SHALL SUBMIT A DETAILED PLAN SHOWING INSTALLATION METHODS, EQUIPMENT AND DRILLING FLUIDS TO BE USED. THE PLAN SHALL INCLUDE THE PROPOSED METHOD TO CONTROL HORIZONTAL AND VERTICAL PROFILE OF THE DIRECTIONAL DRILL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ANY UNDERGROUND UTILITIES LOCATED IN THE DRILLING PROFILE.
3. THE CONTRACTOR SHALL PLAN DRILLING PATH AND SETUP THAT MEETS THE DEPTH REQUIREMENTS AND AVAILABLE WORK AREA.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP AND DISPOSAL OF WASTES FROM DRILLING OPERATION.
5. CONTRACTOR SHALL PROVIDE GEOTECHNICAL REVIEW/ANALYSIS TO CONFIRM MATERIALS/PAVEMENT SECTION WILL NOT COLLAPSE DURING INSTALLATION.

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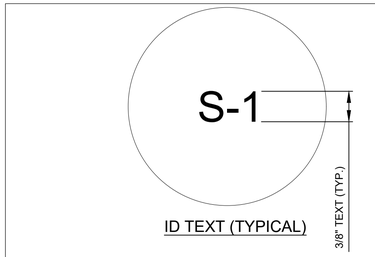
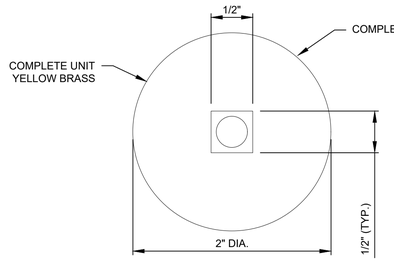
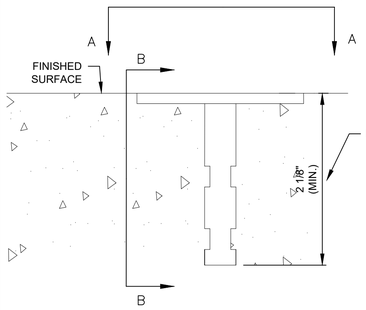
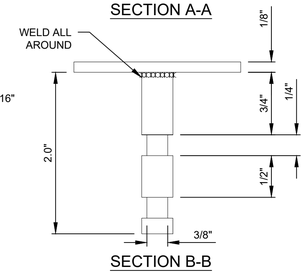




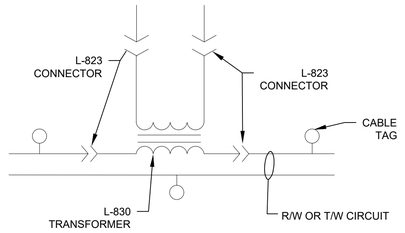




GENERAL NOTES:

1. IDENTIFICATION MARKER SHALL BE INSTALLED DURING THE CONCRETE INSTALLATION.

1 E307 SIGN IDENTIFICATION MARKER



2 E307 LIGHTING CONNECTION SCHEMATIC

PLUG CONNECTOR NOTES:

1. CONTRACTOR SHALL PROVIDE CABLE CIRCUIT IDENTIFICATION MARKERS ATTACHED TO BOTH SIDES OF EACH CABLE CONNECTION.

2. CABLE IDENTIFICATION MARKERS SHALL BE CABLE TAGS ATTACHED VIA TY-RAP PER DETAIL 1.

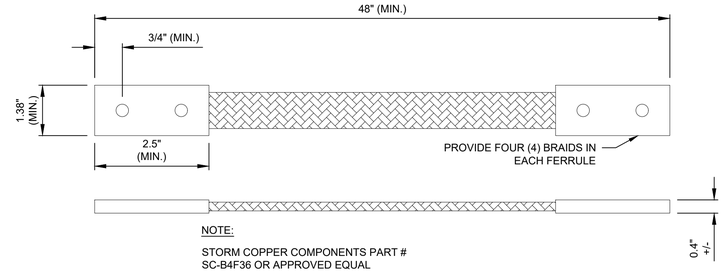
3. THE CABLE SHALL THOROUGHLY BE CLEANED PRIOR TO THE INSTALLATION OF THE L-823 CONNECTOR KIT.

4. INSTALLATION OF THE PIN/RECEPTACLE SHALL BE COMPLETED WITH "CRIMPING" TOOL SUPPLIED OR RECOMMENDED BY THE MANUFACTURER AND DESIGNED FOR THIS SPECIFIC PURPOSE. CRIMPING TOOLS SHALL BE TURNED OVER TO THE AIRPORT UPON COMPLETION OF THE PROJECT.

5. ATTACH EACH CABLE TIE ENOUGH TO HOLD IN PLACE WITHOUT COMPRESSING HOUSING. TRIM OFF EXCESS CABLE TIE.

6. COORDINATE CABLE OUTSIDE DIAMETER WITH CONNECTOR KIT TO ASSURE PROPER AND WATERTIGHT CONNECTION.

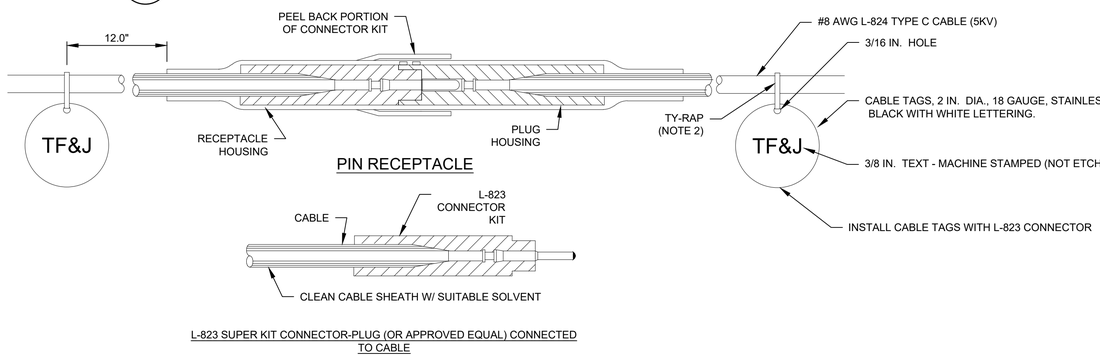
7. INSTALLATION OF L-823 CONNECTOR SHALL BE IN STRICT CONFORMANCE WITH MANUFACTURER'S REQUIREMENTS.



NOTE:

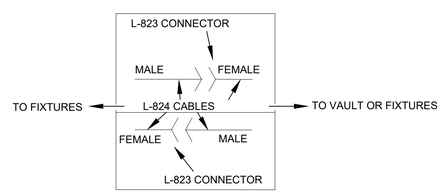
STORM COPPER COMPONENTS PART # SC-B4F36 OR APPROVED EQUAL

4 E307 BRAIDED COPPER GROUND STRAP DETAIL

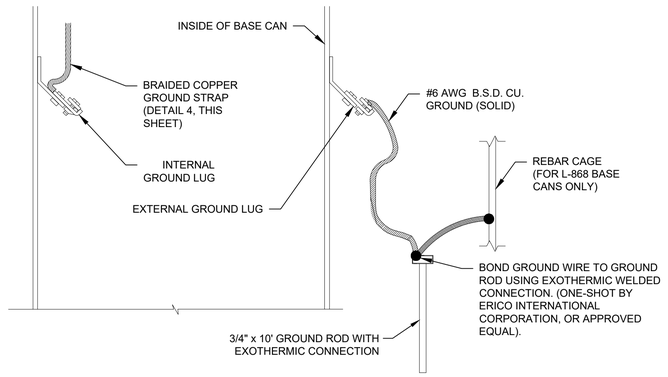


L-823 SUPER KIT CONNECTOR-PLUG (OR APPROVED EQUAL) CONNECTED TO CABLE

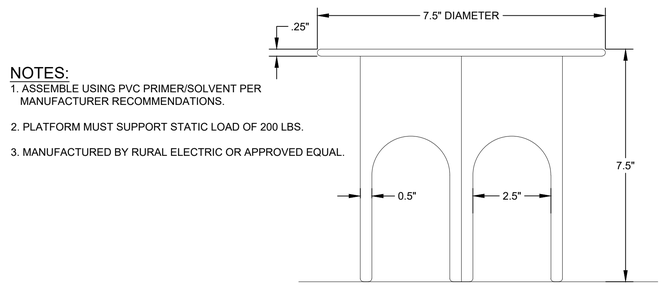
3 E307 TYPICAL L-824 CABLE SPLICE AND CONNECTOR DETAIL



5 E307 TYPICAL L-823 CONNECTOR SCHEMATIC



6 E307 GROUND CONNECTION DETAIL FOR BASE CAN



NOTES:

1. ASSEMBLE USING PVC PRIMER/SOLVENT PER MANUFACTURER RECOMMENDATIONS.
2. PLATFORM MUST SUPPORT STATIC LOAD OF 200 LBS.
3. MANUFACTURED BY RURAL ELECTRIC OR APPROVED EQUAL.

7 E307 AIRFIELD ISOLATION TRANSFORMER PLATFORM

WARNING!!!! WARNING!!!! THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES, AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUND CABLES AND PIPES TRAVERSING THE AIRFIELD PAVEMENT AREAS. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO STARTUP OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY ITEM DAMAGE, CAUSED BY HIS ACTIONS, WITH NO ADDITIONAL COMPENSATION. WARNING!!!!

Drawing: c:\Users\jwagn\DC\ACCDocs\RS&H\10031830005_fay rehab of tw f and g\project files\E\E300.dwg

Plotted on: 4/1/2026 11:54 AM Plotted by: Jimmy Wagner

RS&H, Inc
8521 SIX FORKS RD
SUITE 400
RALEIGH, NC 27615
(919) 926-4100
www.rsandh.com

FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

WALLS ENGINEERING, PLLC
8226 CREEDMOOR ROAD, SUITE 201
RALEIGH, NC 27613
919-522-0628 | NC LICENSE NO. P-0618
www.we-engineering.com

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

FAA NO:	X-XX-XXXX-XXX-XXXX
RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E307

BIDDING DOCUMENTS

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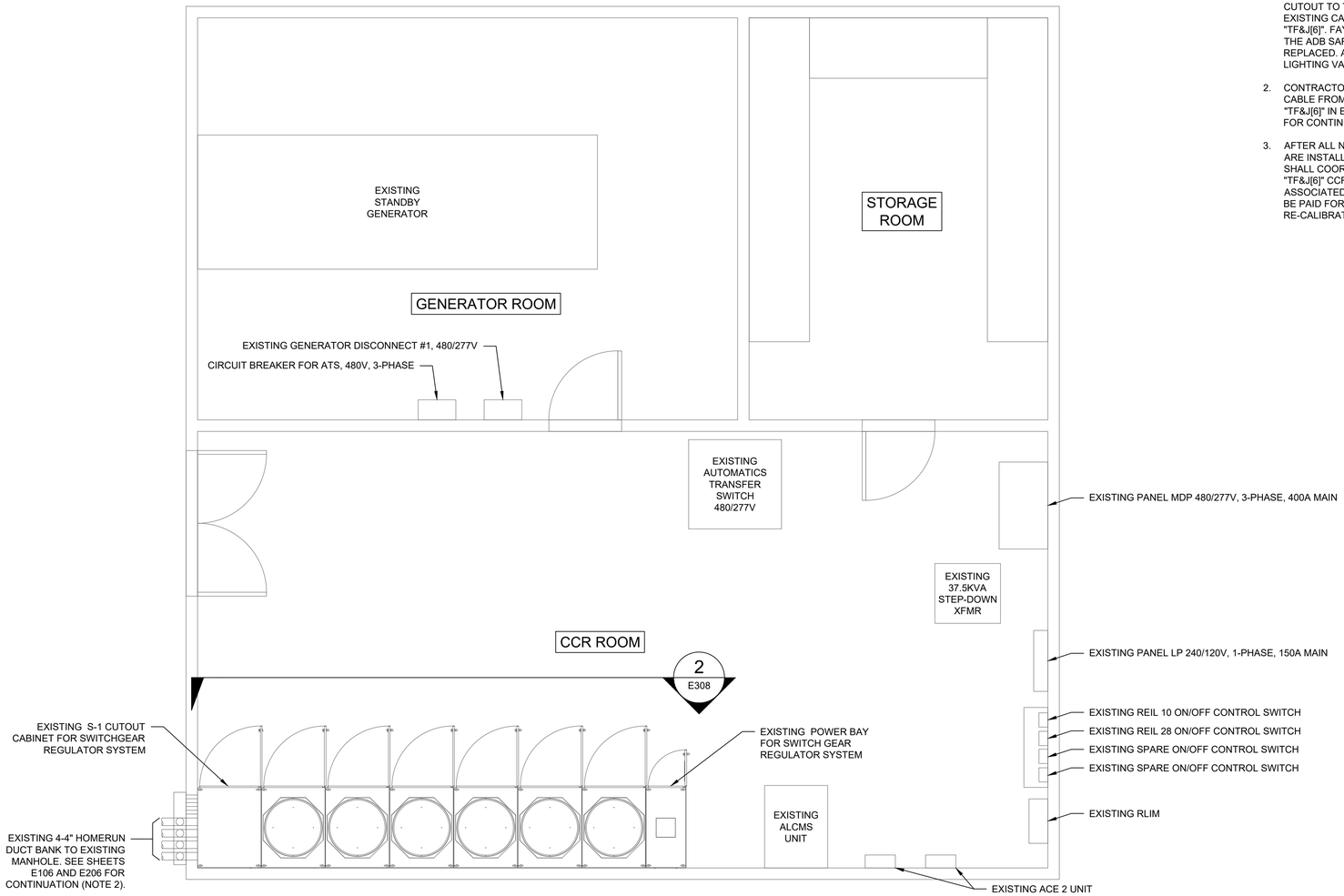
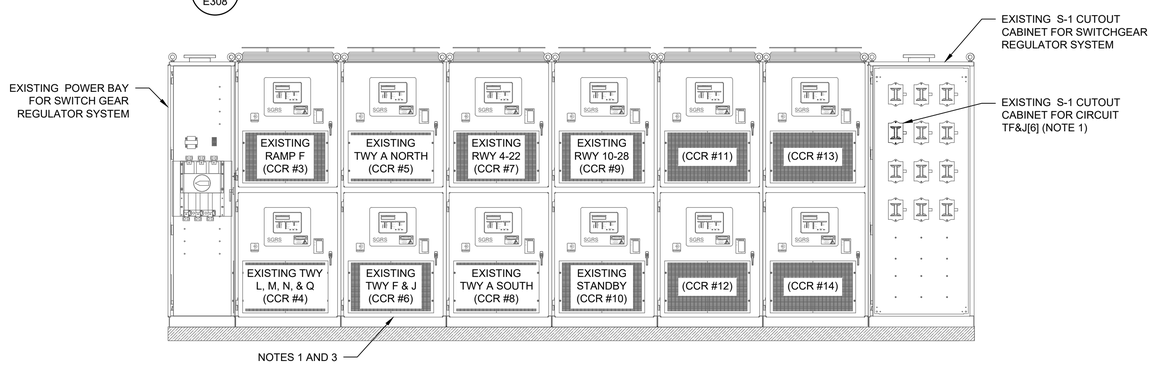
NOTES:

1. CONTRACTOR SHALL TURN OFF THE CCR AND TURN THE S-1 CUTOUT TO THE "OFF" POSITION PRIOR TO REMOVING EXISTING CABLE AND RE-FEEDING NEW CABLE FOR CIRCUIT "TF&J[6]". FAY MAINTENANCE WILL LOCK THE CCR OUT VIA THE ADB SAFEGATE SYSTEM WHILE THE CIRCUIT IS BEING REPLACED. ALL ACTIVITY INVOLVING THE CCR AND AIRFIELD LIGHTING VAULT SHALL BE COORDINATED WITH THE RPR.
2. CONTRACTOR SHALL REMOVE EXISTING CIRCUIT "TF&J[6]" CABLE FROM EXISTING CONDUIT AND INSTALL NEW CIRCUIT "TF&J[6]" IN EXISTING CONDUIT. SEE SHEETS E106 AND E206 FOR CONTINUATION OF THE EXISTING HOMERUN DUCT BANK.
3. AFTER ALL NEW TAXIWAY EDGE LIGHTS, SIGNS, AND CABLE ARE INSTALLED ON THE "TF&J[6]" CIRCUIT, THE CONTRACTOR SHALL COORDINATE THE RE-CALIBRATION OF THE CIRCUIT "TF&J[6]" CCR WITH ADB SAFEGATE, INC. ALL COSTS ASSOCIATED WITH THE RE-CALIBRATION OF THE CCR SHALL BE PAID FOR UNDER THE LUMP SUM LINE ITEM "CCR RE-CALIBRATION COORDINATION WITH ADB SAFEGATE".



1 E308 EXISTING AIRFIELD LIGHTING VAULT LAYOUT



2 E308 EXISTING SWITCH GEAR REGULATOR SYSTEM - ELEVATION VIEW

WARNING!!!! WARNING!!!! THERE ARE A NUMBER OF AIRPORT, PUBLIC UTILITIES, AND FAA LIGHTING, COMMUNICATIONS, UNDERGROUND CABLES AND PIPES TRAVERSING THE AIRFIELD PAVEMENT AREAS. THE ENGINEER HAS MADE EVERY ATTEMPT TO SHOW THE APPROXIMATE LOCATION OF ALL ITEMS. HOWEVER, THE ENGINEER IS NOT RESPONSIBLE FOR SHOWING OR LOCATING EVERY ITEM CURRENTLY IN PLACE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY ITEM LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO STARTUP OF CONSTRUCTION. ANY DAMAGE DONE TO ANY OF THE EXISTING ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY ITEM DAMAGE, CAUSED BY HIS ACTIONS, WITH NO ADDITIONAL COMPENSATION. WARNING!!!!

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TAXIWAY F AND G REHABILITATION PACKAGE

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NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR

FAA NO:	X-XX-XXXX-XXX-XXXX
RS&H NO:	1003-1830-005
DATE ISSUED:	04/02/2026
DESIGN BY:	JTW
DRAWN BY:	AHT
REVIEWED BY:	JTW

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E308

BIDDING DOCUMENTS

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Drawing: c:\Users\jwagn\DC\ACCDocs\RS&H\10031830005_fay rehab of tw f and g\project files\E\E300.dwg
Plotted on: 4/1/2026 11:54 AM
Plotted by: Jimmy Wagner

FAYETTEVILLE NC
AMERICA'S CAN DO CITY

PURCHASING

June 23, 2026

MEMO TO: Prospective Bidders

FROM: Kimberly Toon, Purchasing Manager

SUBJECT: **Addendum #1:** Rehabilitation of Taxiway Foxtrot and Golf Project

DUE DATE AND TIME: **JULY 09, 2026; 2:00 p.m.**

1. The Bid Documents are hereby modified by this Addendum #1 dated June 23, 2026. To include the following:

    a. **Pre-Bid Meeting attendance sheets and Pre-Bid Meeting presentation from the Pre-Bid Meeting on June 16, 2026 at 10:00 AM EST has been added.**

2. The foregoing changes shall be incorporated in the Bid Documents, and a copy of the Addendum #1, signed by the Bidder, must accompany the Bid to indicate the Bidder's familiarity with the changes.

ATTACHMENTS: Pre-Bid meeting Attendance Sheets, Pre-Bid Meeting Presentation

Bidder Acknowledgement:

Bidder Name (Print):_____

Bidder Signature:_____

Date of Signature:_____

Meeting Attendance

RS & H, Inc.
Architectural, Engineering, Planning and Environmental Services

Date: Tuesday, June 16, 2026
Project Number: 1003-1830-005
Project Name: Rehabilitation of Taxiways Foxtrot and Golf

Place: 400 Airport Road
Fayetteville, NC 28306
Boeing Conference Room (1st Floor-Airport)

Time: 10:00 AM EST

Subject: Pre-Bid Meeting

NAME	ORGANIZATION	PHONE #	EMAIL
Tarryn Little	RS&H	919-926-4103	Tarryn.Little@rsandh.com
Ella Gersack	RS&H	919-926-4136	Ella.Gersack@rsandh.com
Tobias Horne	Dickerson Infrastructure	704 345 1867	thorne@dfifl.com
Benjamin Reynolds	Dickerson	~~331~~ 336-244-9062	Breynolds@dfifl.com
Will Vest	ZC Grading/CM	336-749-9231	will@zcgrading.com
Scotty Scott	Barnhill Contracting Co	910-624-3108	sscott@barnhillcontracting.com
Lance Bullard	Barnhill Contracting	910 880 4436	lbullard@barnhillcontracting.com
Chip Barnes	RNC	919-710-2926	cbarnes@riftonburg.com
Grayson Taylor	Aviator Paving	919-815-1073	grayson@aviatorpaving.com
Will Leland	Barnhill Contracting	252 824 8295	wleland@barnhillcontracting.com

NAME	ORGANIZATION	PHONE	EMAIL
Davis Byrd	Highland Paving	910 214 2018	dbyrd@highlandpaving.com

Meeting Attendance

RS & H, Inc.
Architectural, Engineering, Planning and Environmental Services

Date: Tuesday, June 16, 2026
Project Number: 1003-1830-005
Project Name: Rehabilitation of Taxiways Foxtrot and Golf

Place: 400 Airport Road
Fayetteville, NC 28306
Boeing Conference Room (1st Floor-Airport)

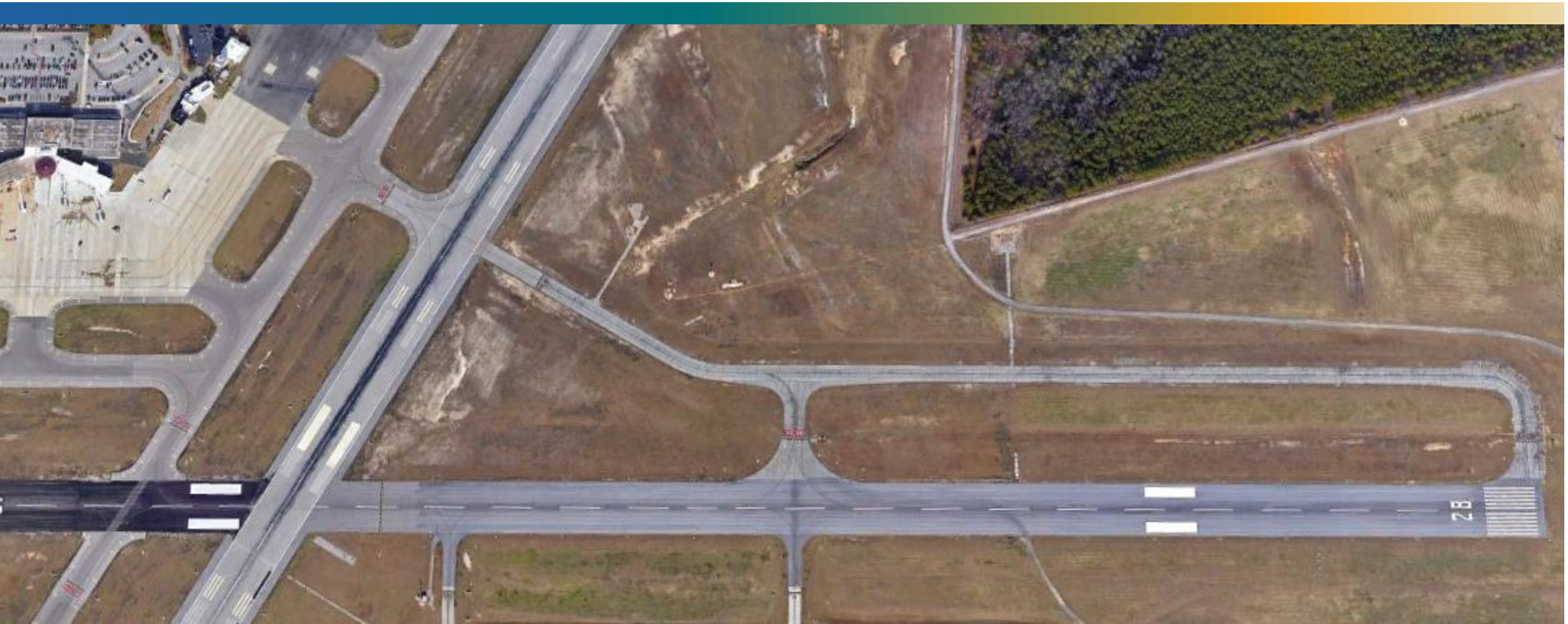
Time: 10:00 AM EST

Subject: Pre-Bid Meeting

NAME	ORGANIZATION	PHONE #	EMAIL
Tanya Hazlett	City of Fayetteville	910-433-1266	TanyaHazlett@FayettevilleNC.Gov
Walter Lennon	City of Fayetteville	910-433-1222	WalterLennon@FayettevilleNC.Gov
Mike Sedlock	Fred Smith Company	919-422-1573	msedlock@fredsmithcompany.net
Wesley Bolton	FAA	901-322-8163	Wesley.J.Bolton@faa.gov
Larry Pierce	Rifenburg Construction	919-691-3616	lpierce@rifenburg.com

June 16, 2026
10:00 AM

Rehabilitation of Taxiway Foxtrot and Golf Pre-Bid Meeting



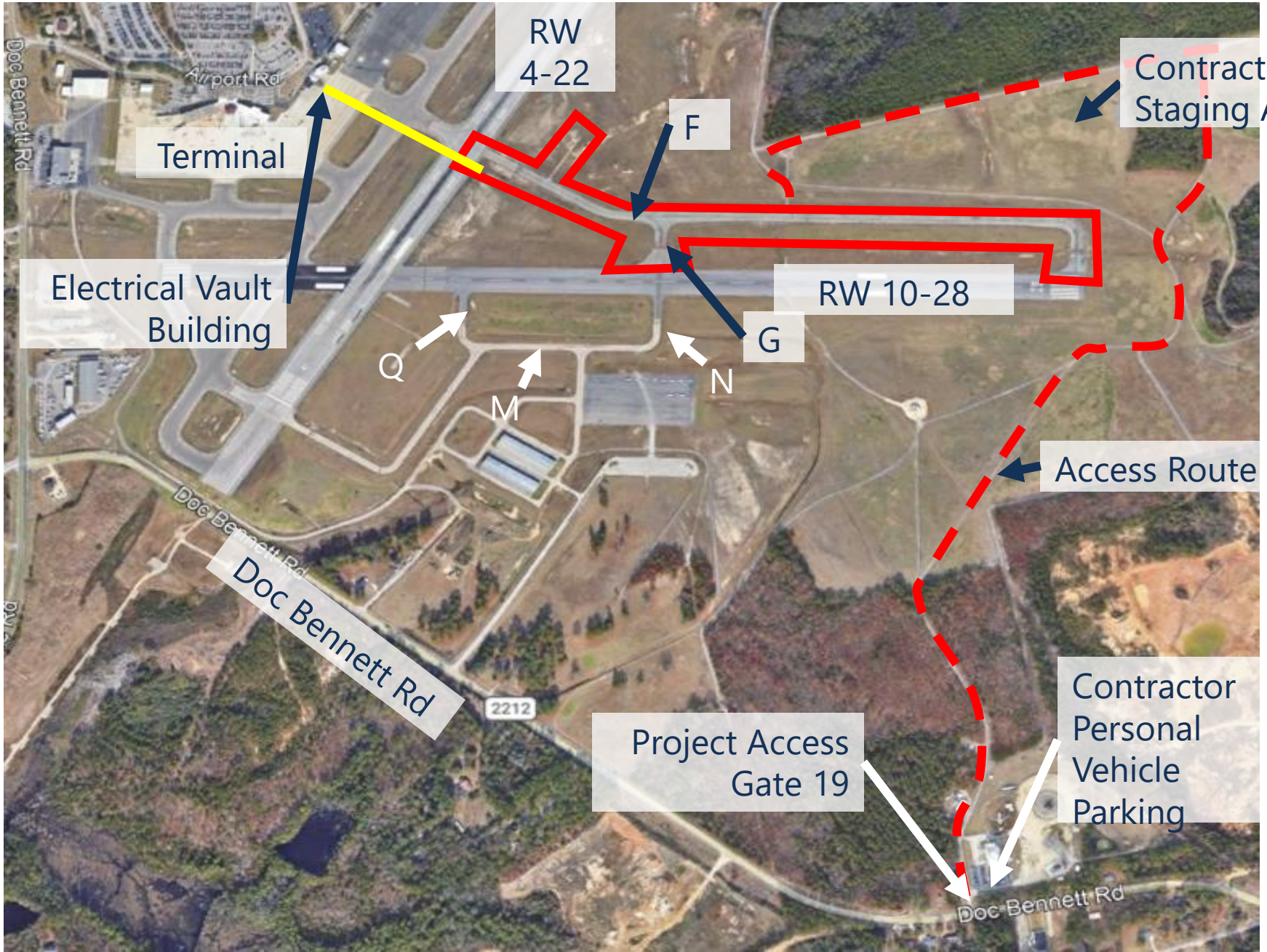
Pre-Bid Meeting Agenda

1. Introduction
2. Project Location
3. Notice and Instruction to Bidders
4. Schedule
5. Small Business Program
6. Project Overview/ Scope
7. Q/A

Introduction

- Andrew LaGala – Airport Director
- Deontae Watson – Deputy Airport Director
- Tarryn Little – Project Manager
- Ella Gersack – Engineering Associate

Project Location



Notice and Instructions to Bidders

- **Advertisement Issued:**
  June 5, 2026
- **Bids Must Be Submitted by:**
  2:00 pm on July 9, 2026.
- **Location:** 400 Airport Road Fayetteville, NC 28306 Boeing Conference Room (1st Floor-Airport)
- **Plans and Specifications:** Downloadable in PDF format from https://www.fayettevillenc.gov/City-Departments/Finance/Purchasing/Bid-Opportunities
- All Addenda will be downloadable in PDF format from https://www.fayettevillenc.gov/City-Departments/Finance/Purchasing/Bid-Opportunities

Notice and Instructions to Bidders

- Bid Security 5%
- Performance and Payment Bonds: 100% of the Contract Amount
- Small Business Goal: 0%
- **Submit Questions on Solicitation by:**
  5:00 pm on June 24, 2026
  To Ella Gersack, Engineering Associate RS&H, at
  Ella.Gersack@rsandh.com

Bid Submission – Mailing or Shipping Bid Packages

- Bids may be mailed to the City Purchasing Office, **Attn: Kimberly Toon, Purchasing Manager, 433 Hay Street, Fayetteville, NC 28301**
  - Bids may be delivered in person or by express mail to the same address

Bids should be sealed and on the "from" label include:

- Project number
- Project Title
- Bidder's Name
- Address
- Contractor's license number and status

- **Bids Received:** 2:00 pm on July 9, 2026.
- **Bid Opening Location:** 400 Airport Road Fayetteville, NC 28306 Boeing Conference Room (1st Floor-Airport)

Schedule

- **Advertisement Issued:**
  June 5, 2026
- **Submit Questions on Solicitation by:**
  5:00 pm on June 24, 2026
  To Ella Gersack, Engineering Associate RS&H, at
  Ella.Gersack@rsandh.com
- **Bids Must Be Submitted by:**
  2:00 pm on July 9, 2026.
- **Estimated Construction Start:** September 2026

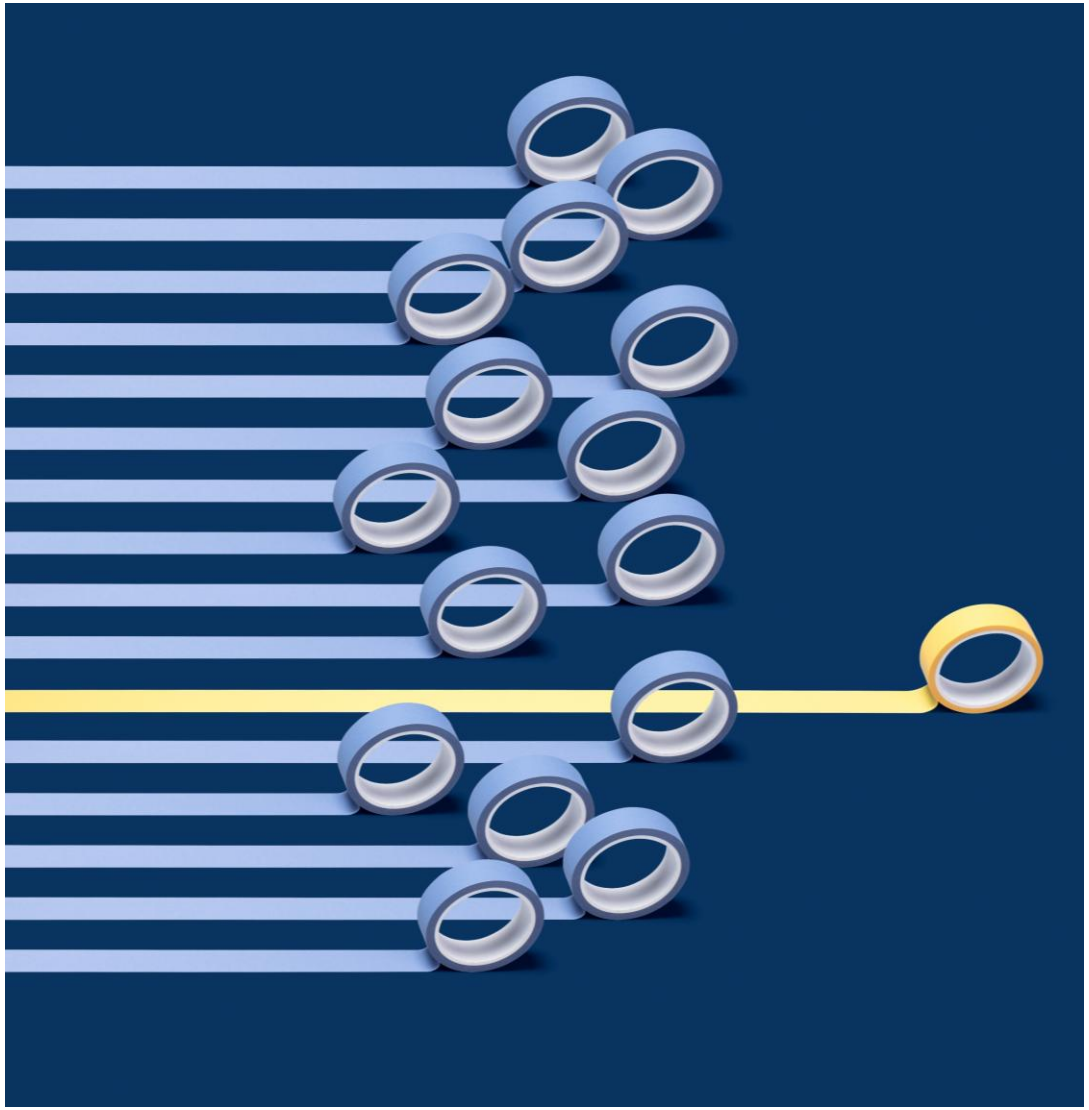
Small Business Program

Small Business Program

- Open to any business that meets the size standard
- An SDBE is a business concern that is small as defined by applicable SBA size standards or City thresholds for the relevant NAICS code, and owned and controlled by individuals who have experienced economic disadvantage — without regard to race, gender, or ethnicity.
- The City of Fayetteville is committed to broadening economic opportunity by encouraging the participation of Small Disadvantaged Business Enterprises (SDBEs) in City-funded contracts.

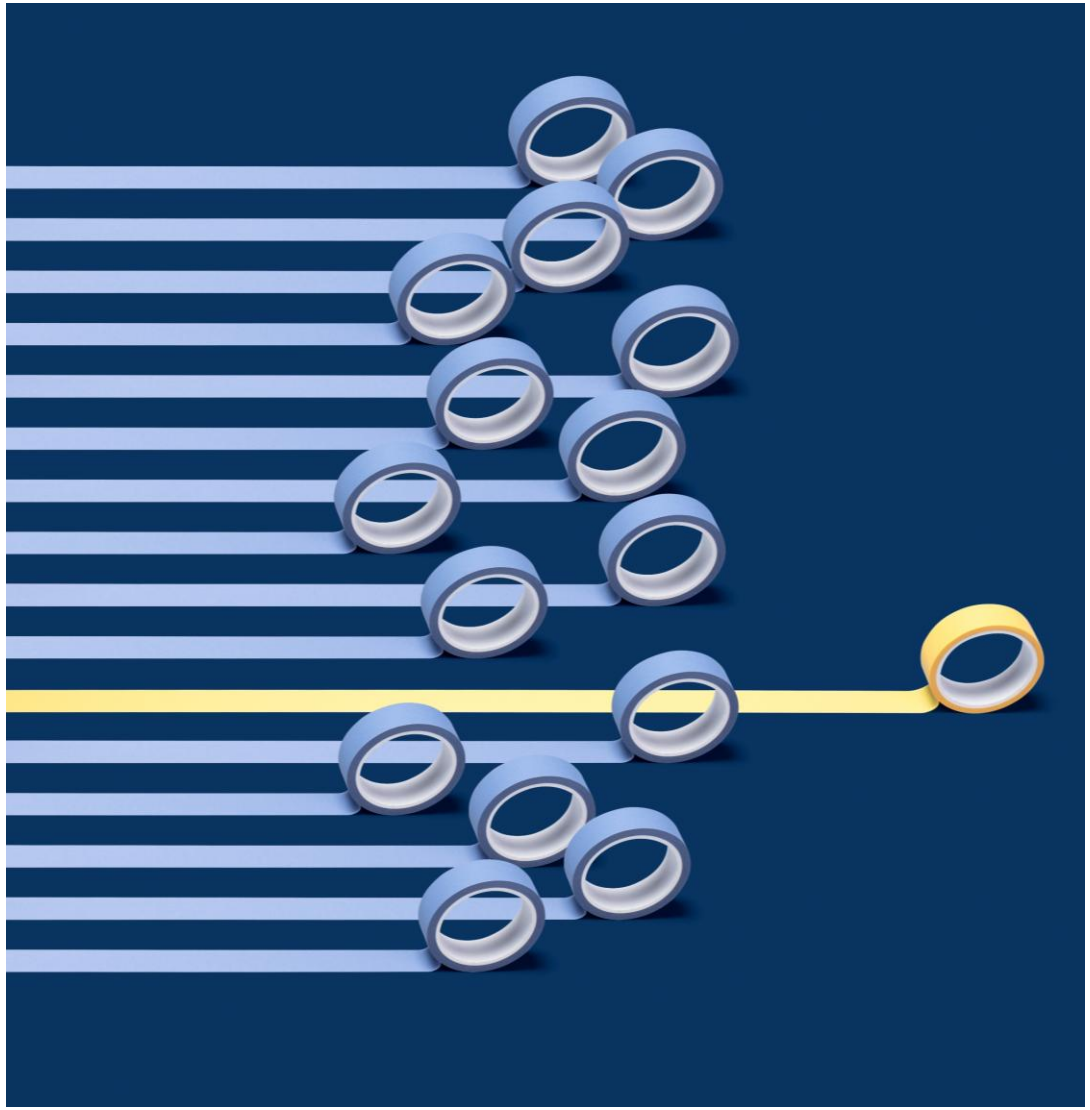
Small Business Goal

- **Compliance to all SDBE rules and regulations is required.**
- The contractor is expected to submit all forms and documents associated with the SDBE program.
- **The SDBE goal for this project:** 0%



How to Find Certified Firms

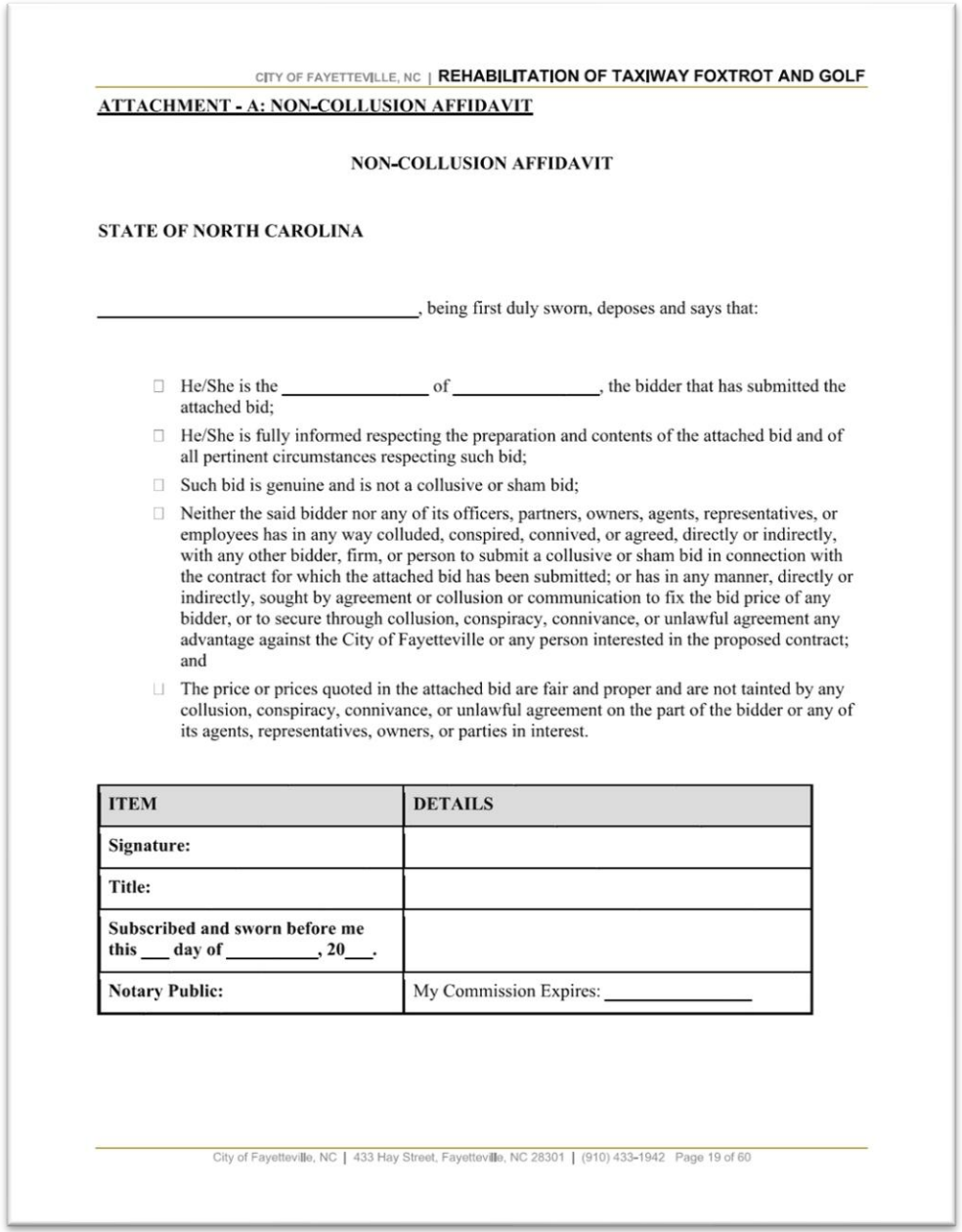
- To search for certified SDBE firms, contact the City of Fayetteville Purchasing Division or visit: www.fayettevillenc.gov/purchasing



Required Bid Forms

Attachment A: Signed Non-Collusion Affidavit

- Indicates that the contractor is fully informed respecting the preparation and contents of the attached bid
- Confirms bid is genuine and is not a collusive bid
- Confirms the price or prices quoted in the bid are fair and proper and are not tainted by any collusion



ATTACHMENT - A: NON-COLLUSION AFFIDAVIT

NON-COLLUSION AFFIDAVIT

STATE OF NORTH CAROLINA

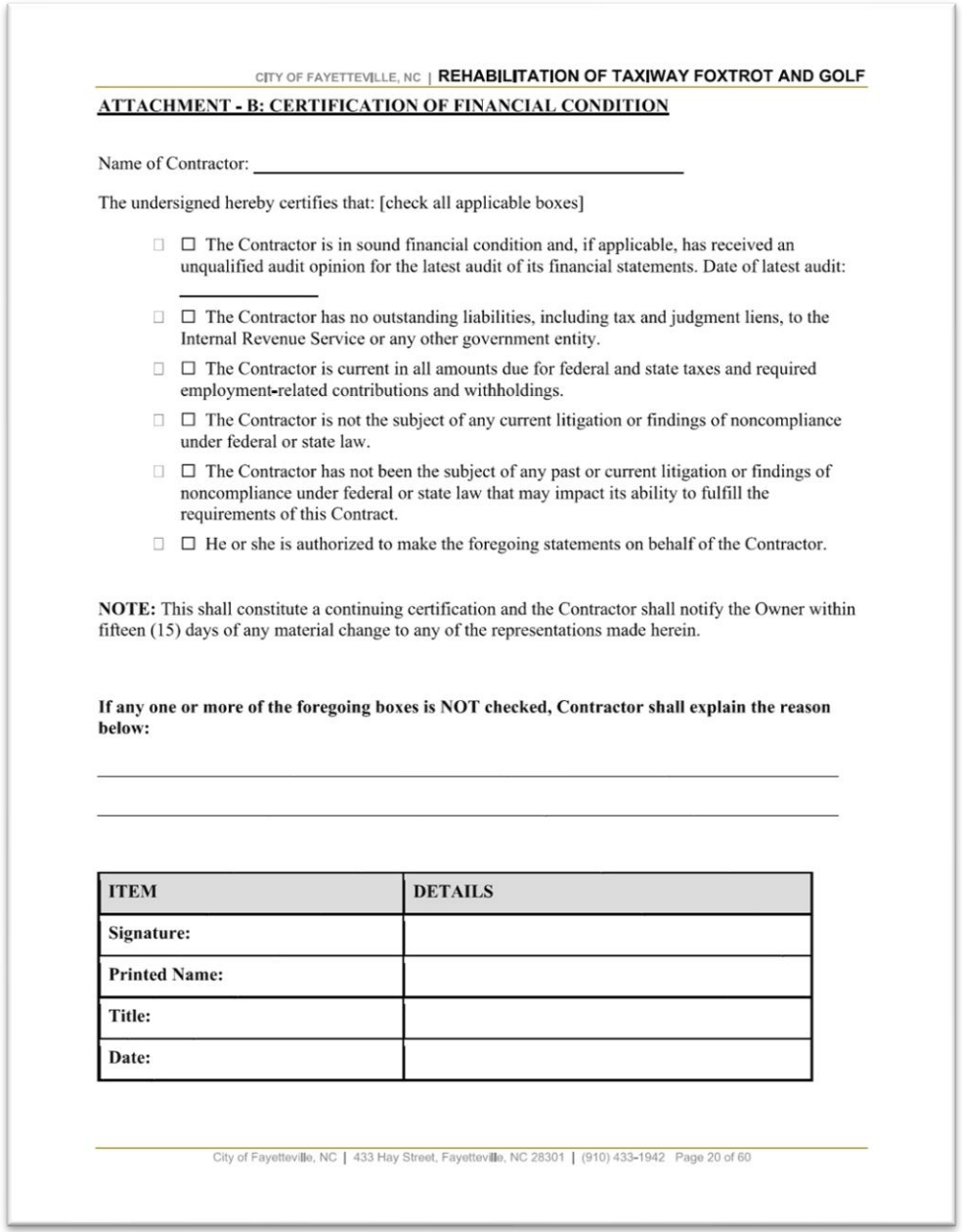
_____, being first duly sworn, deposes and says that:

- ☐ He/She is the _____ of _____, the bidder that has submitted the attached bid;
- ☐ He/She is fully informed respecting the preparation and contents of the attached bid and of all pertinent circumstances respecting such bid;
- ☐ Such bid is genuine and is not a collusive or sham bid;
- ☐ Neither the said bidder nor any of its officers, partners, owners, agents, representatives, or employees has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other bidder, firm, or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted; or has in any manner, directly or indirectly, sought by agreement or collusion or communication to fix the bid price of any bidder, or to secure through collusion, conspiracy, connivance, or unlawful agreement any advantage against the City of Fayetteville or any person interested in the proposed contract; and
- ☐ The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, or parties in interest.

ITEM	DETAILS
Signature:	
Title:	
Subscribed and sworn before me this ___ day of _____, 20___.	
Notary Public:	My Commission Expires: _____

Attachment B: Certification of Financial Condition

- Indicates that the contractor is in sound financial condition and has no outstanding liabilities



ATTACHMENT - B: CERTIFICATION OF FINANCIAL CONDITION

Name of Contractor: _____

The undersigned hereby certifies that: [check all applicable boxes]

- ☐ The Contractor is in sound financial condition and, if applicable, has received an unqualified audit opinion for the latest audit of its financial statements. Date of latest audit: _____
- ☐ The Contractor has no outstanding liabilities, including tax and judgment liens, to the Internal Revenue Service or any other government entity.
- ☐ The Contractor is current in all amounts due for federal and state taxes and required employment-related contributions and withholdings.
- ☐ The Contractor is not the subject of any current litigation or findings of noncompliance under federal or state law.
- ☐ The Contractor has not been the subject of any past or current litigation or findings of noncompliance under federal or state law that may impact its ability to fulfill the requirements of this Contract.
- ☐ He or she is authorized to make the foregoing statements on behalf of the Contractor.

NOTE: This shall constitute a continuing certification and the Contractor shall notify the Owner within fifteen (15) days of any material change to any of the representations made herein.

If any one or more of the foregoing boxes is NOT checked, Contractor shall explain the reason below:

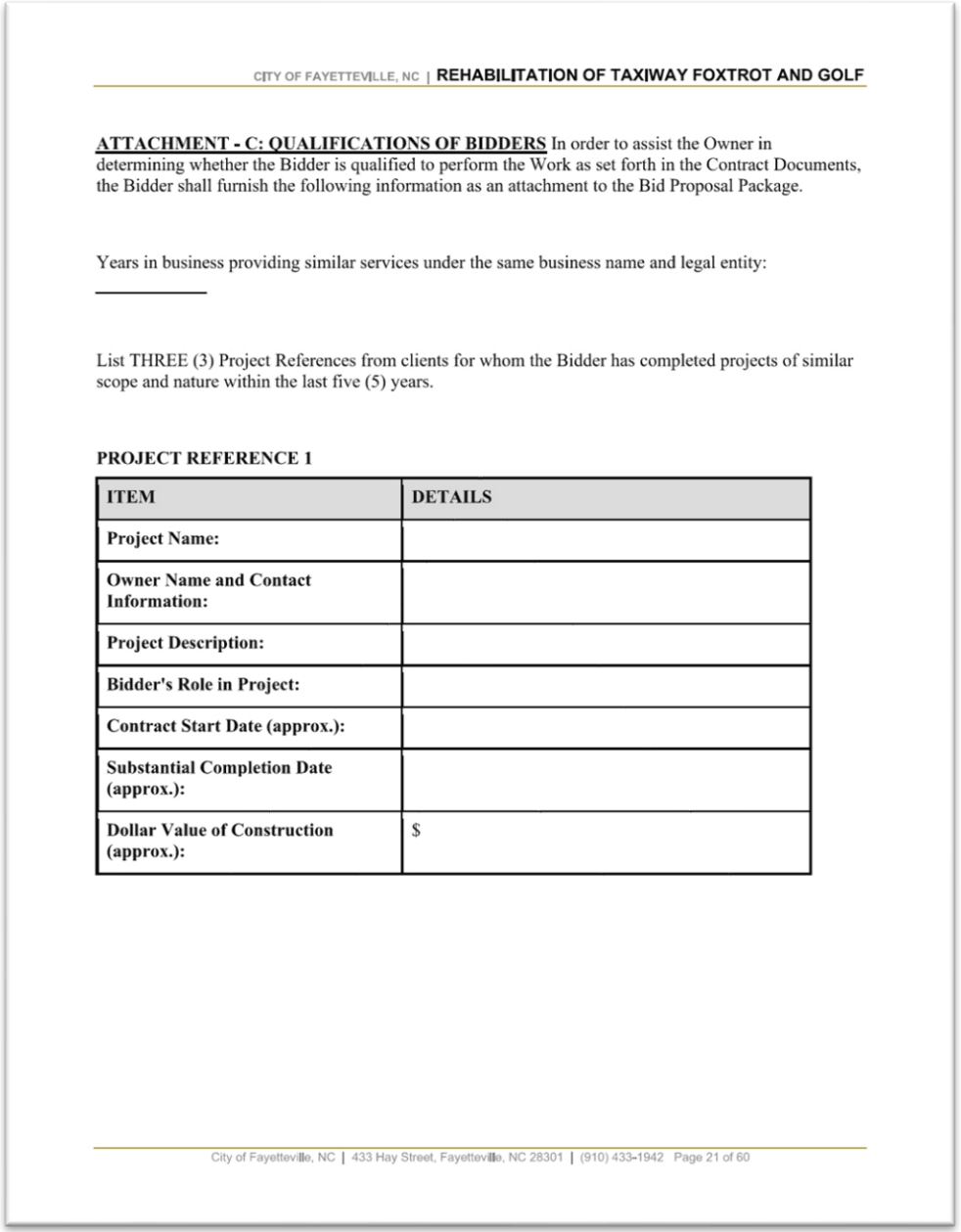
_____

_____

ITEM	DETAILS
Signature:	
Printed Name:	
Title:	
Date:	

Attachment C: Qualifications of Bidders - 3 references

- Provide the number of years in business providing similar services under the same business name and legal entity
- Provide three (3) Project References from clients for whom the Bidder has completed projects of similar scope and nature within the last five (5) years.



ATTACHMENT - C: QUALIFICATIONS OF BIDDERS In order to assist the Owner in determining whether the Bidder is qualified to perform the Work as set forth in the Contract Documents, the Bidder shall furnish the following information as an attachment to the Bid Proposal Package.

Years in business providing similar services under the same business name and legal entity: _____

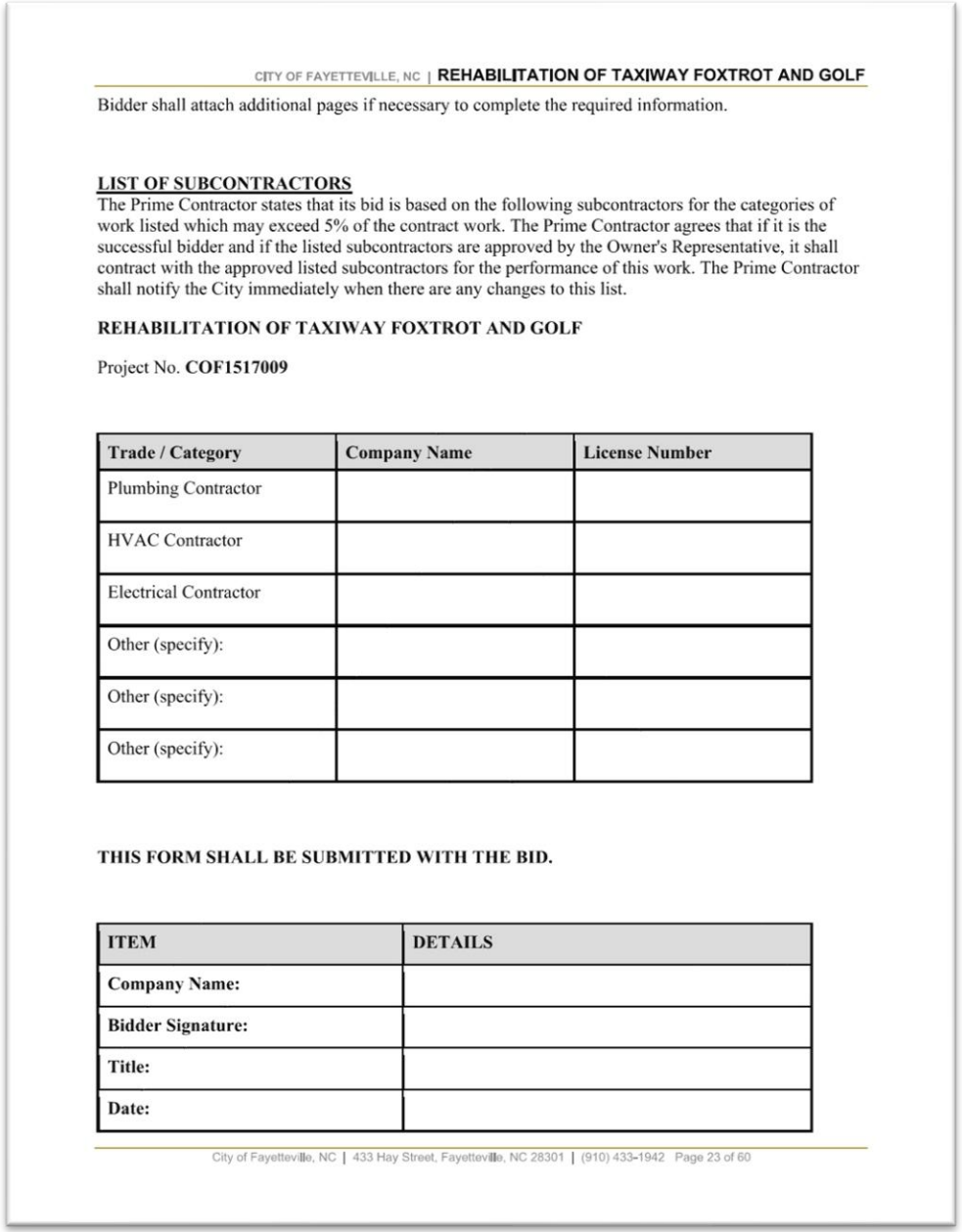
List THREE (3) Project References from clients for whom the Bidder has completed projects of similar scope and nature within the last five (5) years.

PROJECT REFERENCE 1

ITEM	DETAILS
Project Name:	
Owner Name and Contact Information:	
Project Description:	
Bidder's Role in Project:	
Contract Start Date (approx.):	
Substantial Completion Date (approx.):	
Dollar Value of Construction (approx.):	$

List of Subcontractors

- Provide list of subcontractors for the categories of work listed which may exceed 5% of the contract work



Bidder shall attach additional pages if necessary to complete the required information.

LIST OF SUBCONTRACTORS

The Prime Contractor states that its bid is based on the following subcontractors for the categories of work listed which may exceed 5% of the contract work. The Prime Contractor agrees that if it is the successful bidder and if the listed subcontractors are approved by the Owner's Representative, it shall contract with the approved listed subcontractors for the performance of this work. The Prime Contractor shall notify the City immediately when there are any changes to this list.

REHABILITATION OF TAXIWAY FOXTROT AND GOLF

Project No. **COF1517009**

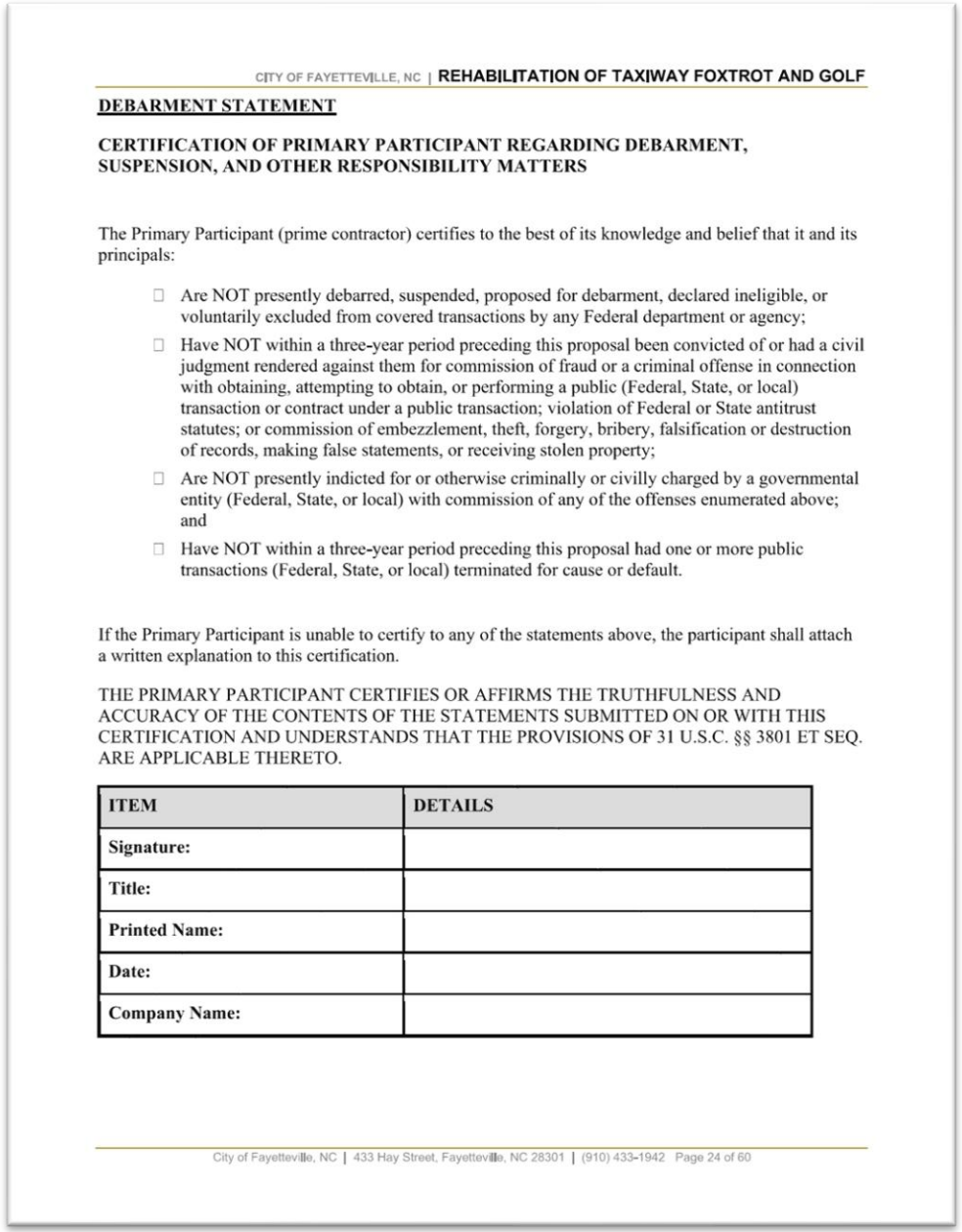
Trade / Category	Company Name	License Number
Plumbing Contractor		
HVAC Contractor		
Electrical Contractor		
Other (specify):		
Other (specify):		
Other (specify):		

THIS FORM SHALL BE SUBMITTED WITH THE BID.

ITEM	DETAILS
Company Name:	
Bidder Signature:	
Title:	
Date:	

Debarment, Suspension & Responsibility Certification

- Confirms that the applicant is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency



DEBARMENT STATEMENT

CERTIFICATION OF PRIMARY PARTICIPANT REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The Primary Participant (prime contractor) certifies to the best of its knowledge and belief that it and its principals:

- ☐ Are NOT presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- ☐ Have NOT within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- ☐ Are NOT presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated above; and
- ☐ Have NOT within a three-year period preceding this proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

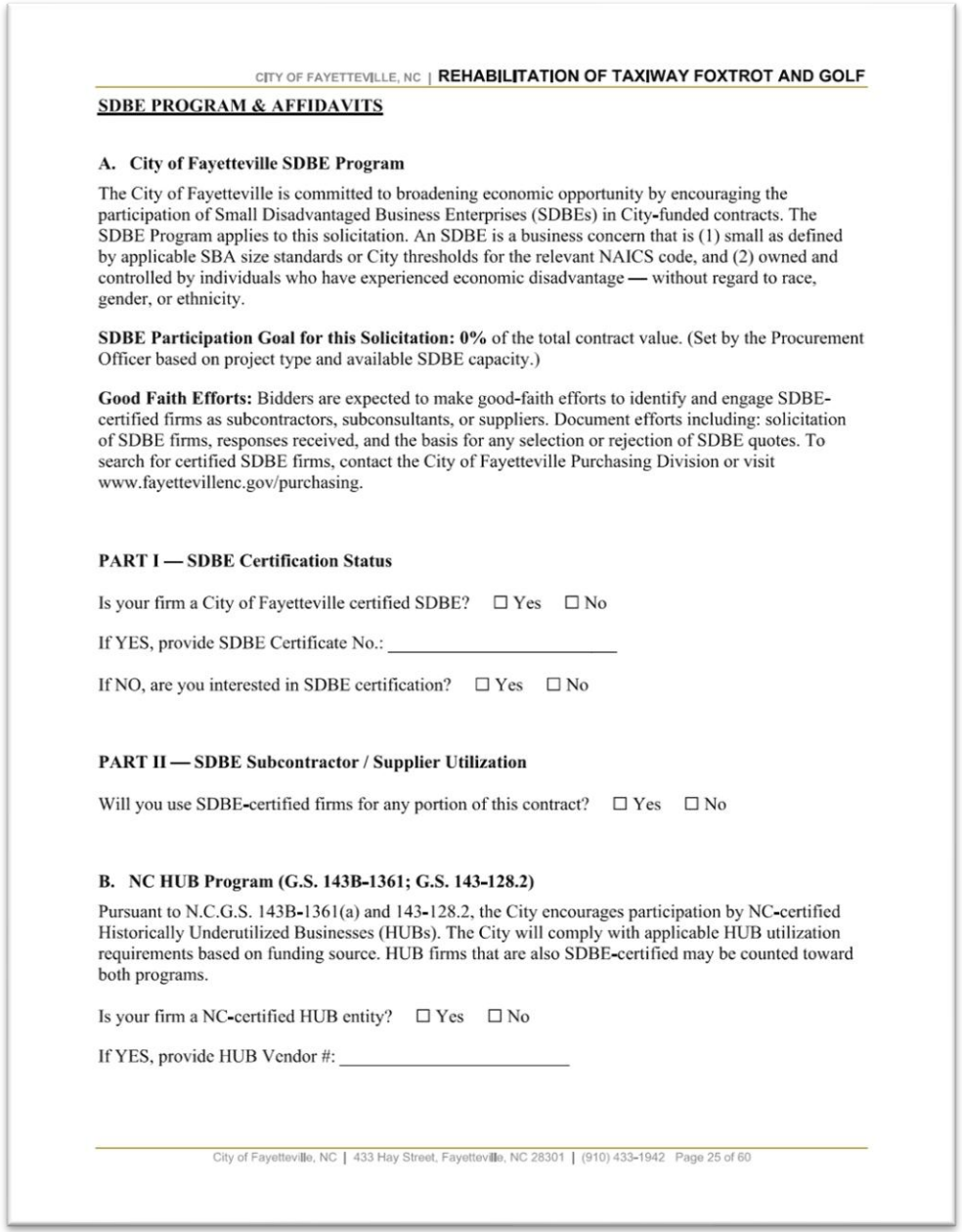
If the Primary Participant is unable to certify to any of the statements above, the participant shall attach a written explanation to this certification.

THE PRIMARY PARTICIPANT CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. §§ 3801 ET SEQ. ARE APPLICABLE THERETO.

ITEM	DETAILS
Signature:	
Title:	
Printed Name:	
Date:	
Company Name:	

SDBE Program Forms / HUB Affidavits (A, B, and C)

- No submissions are required for HUB affidavit A, B, and C
- Bidders are expected to make good-faith efforts to identify and engage SDBE-certified firms as subcontractors, subconsultants, or suppliers
- Document efforts including: solicitation of SDBE firms, responses received, and the basis for any selection or rejection of SDBE quotes



CITY OF FAYETTEVILLE, NC | REHABILITATION OF TAXIWAY FOXTROT AND GOLF

SDBE PROGRAM & AFFIDAVITS

A. City of Fayetteville SDBE Program

The City of Fayetteville is committed to broadening economic opportunity by encouraging the participation of Small Disadvantaged Business Enterprises (SDBEs) in City-funded contracts. The SDBE Program applies to this solicitation. An SDBE is a business concern that is (1) small as defined by applicable SBA size standards or City thresholds for the relevant NAICS code, and (2) owned and controlled by individuals who have experienced economic disadvantage — without regard to race, gender, or ethnicity.

SDBE Participation Goal for this Solicitation: 0% of the total contract value. (Set by the Procurement Officer based on project type and available SDBE capacity.)

Good Faith Efforts: Bidders are expected to make good-faith efforts to identify and engage SDBE-certified firms as subcontractors, subconsultants, or suppliers. Document efforts including: solicitation of SDBE firms, responses received, and the basis for any selection or rejection of SDBE quotes. To search for certified SDBE firms, contact the City of Fayetteville Purchasing Division or visit www.fayettevillenc.gov/purchasing.

PART I — SDBE Certification Status

Is your firm a City of Fayetteville certified SDBE? ☐ Yes ☐ No

If YES, provide SDBE Certificate No.: _____

If NO, are you interested in SDBE certification? ☐ Yes ☐ No

PART II — SDBE Subcontractor / Supplier Utilization

Will you use SDBE-certified firms for any portion of this contract? ☐ Yes ☐ No

B. NC HUB Program (G.S. 143B-1361; G.S. 143-128.2)

Pursuant to N.C.G.S. 143B-1361(a) and 143-128.2, the City encourages participation by NC-certified Historically Underutilized Businesses (HUBs). The City will comply with applicable HUB utilization requirements based on funding source. HUB firms that are also SDBE-certified may be counted toward both programs.

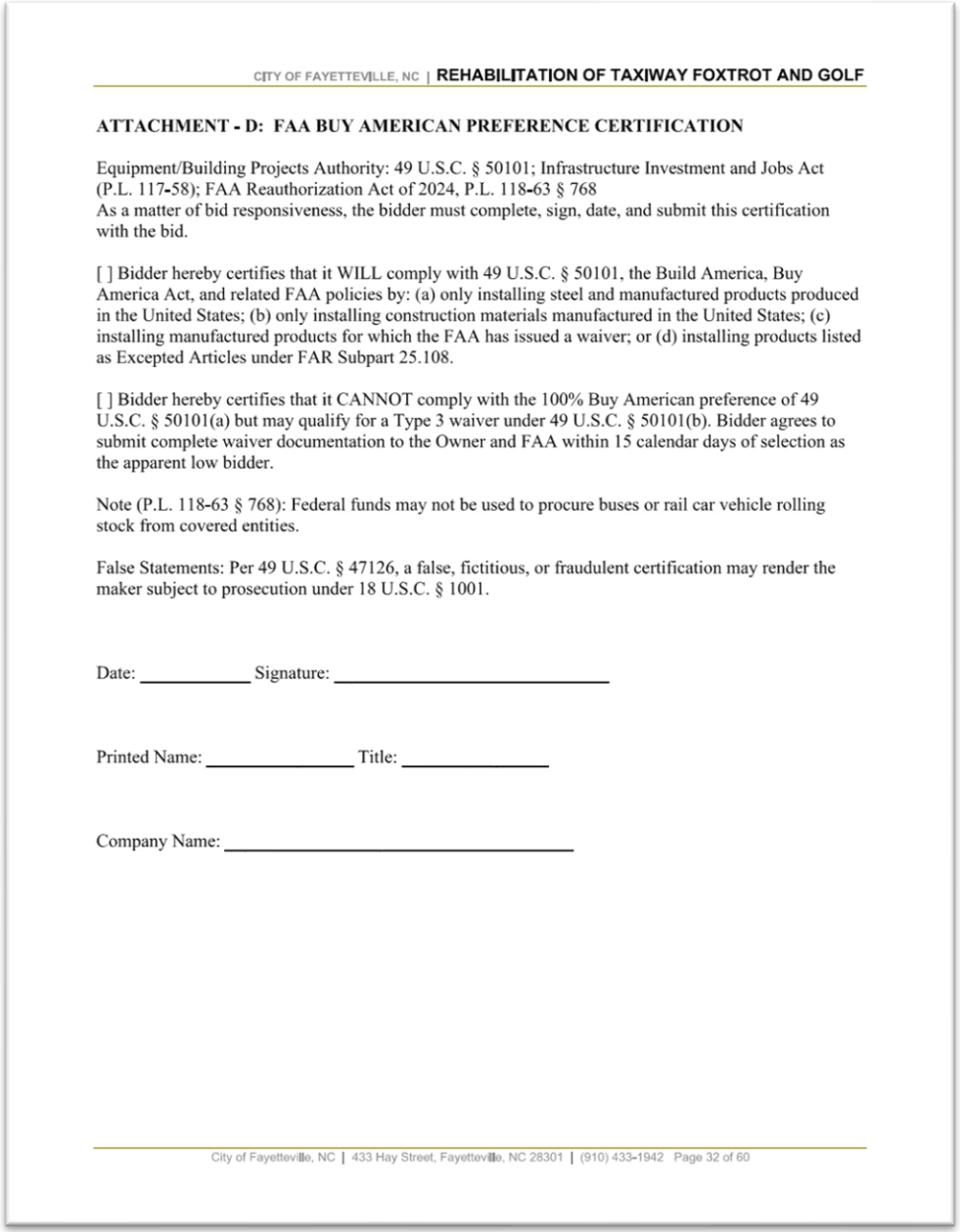
Is your firm a NC-certified HUB entity? ☐ Yes ☐ No

If YES, provide HUB Vendor #: _____

City of Fayetteville, NC | 433 Hay Street, Fayetteville, NC 28301 | (910) 433-1942 Page 25 of 60

Attachment D: FAA Buy American Preference

- Required for AIP Projects
- Bidder must complete, sign, date, and submit this certification with the bid



ATTACHMENT - D: FAA BUY AMERICAN PREFERENCE CERTIFICATION

Equipment/Building Projects Authority: 49 U.S.C. § 50101; Infrastructure Investment and Jobs Act (P.L. 117-58); FAA Reauthorization Act of 2024, P.L. 118-63 § 768
As a matter of bid responsiveness, the bidder must complete, sign, date, and submit this certification with the bid.

[ ] Bidder hereby certifies that it WILL comply with 49 U.S.C. § 50101, the Build America, Buy America Act, and related FAA policies by: (a) only installing steel and manufactured products produced in the United States; (b) only installing construction materials manufactured in the United States; (c) installing manufactured products for which the FAA has issued a waiver; or (d) installing products listed as Excepted Articles under FAR Subpart 25.108.

[ ] Bidder hereby certifies that it CANNOT comply with the 100% Buy American preference of 49 U.S.C. § 50101(a) but may qualify for a Type 3 waiver under 49 U.S.C. § 50101(b). Bidder agrees to submit complete waiver documentation to the Owner and FAA within 15 calendar days of selection as the apparent low bidder.

Note (P.L. 118-63 § 768): Federal funds may not be used to procure buses or rail car vehicle rolling stock from covered entities.

False Statements: Per 49 U.S.C. § 47126, a false, fictitious, or fraudulent certification may render the maker subject to prosecution under 18 U.S.C. § 1001.

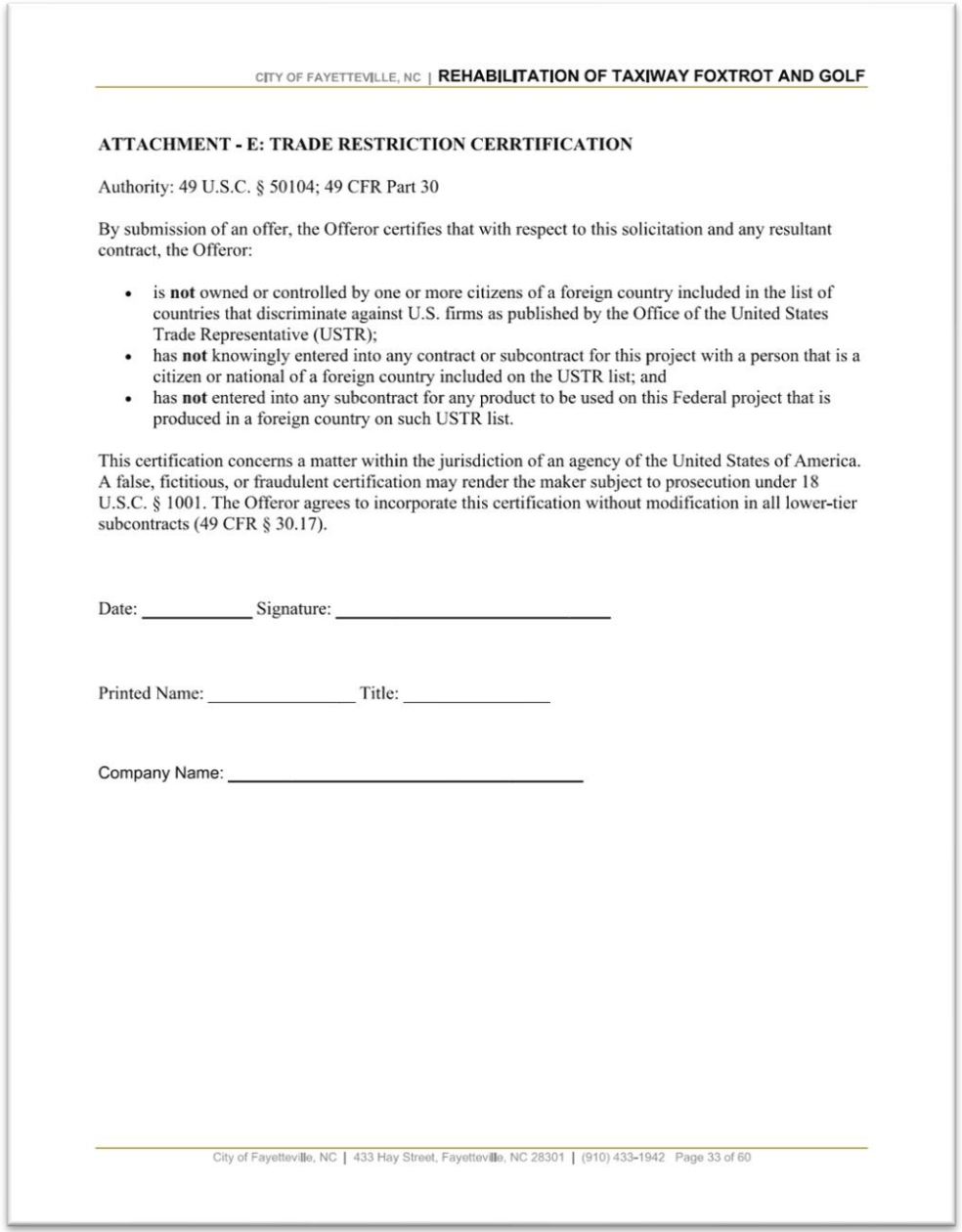
Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

Attachment E: Trade Restriction Certification

- Ensures compliance with United States trade restrictions



ATTACHMENT - E: TRADE RESTRICTION CERRTIFICATION

Authority: 49 U.S.C. § 50104; 49 CFR Part 30

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

- is **not** owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
- 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 USTR list; and
- has **not** entered into any subcontract for any product to be used on this Federal project that is produced in a foreign country on such USTR list.

This certification concerns a matter within the jurisdiction of an agency of the United States of America. A false, fictitious, or fraudulent certification may render the maker subject to prosecution under 18 U.S.C. § 1001. The Offeror agrees to incorporate this certification without modification in all lower-tier subcontracts (49 CFR § 30.17).

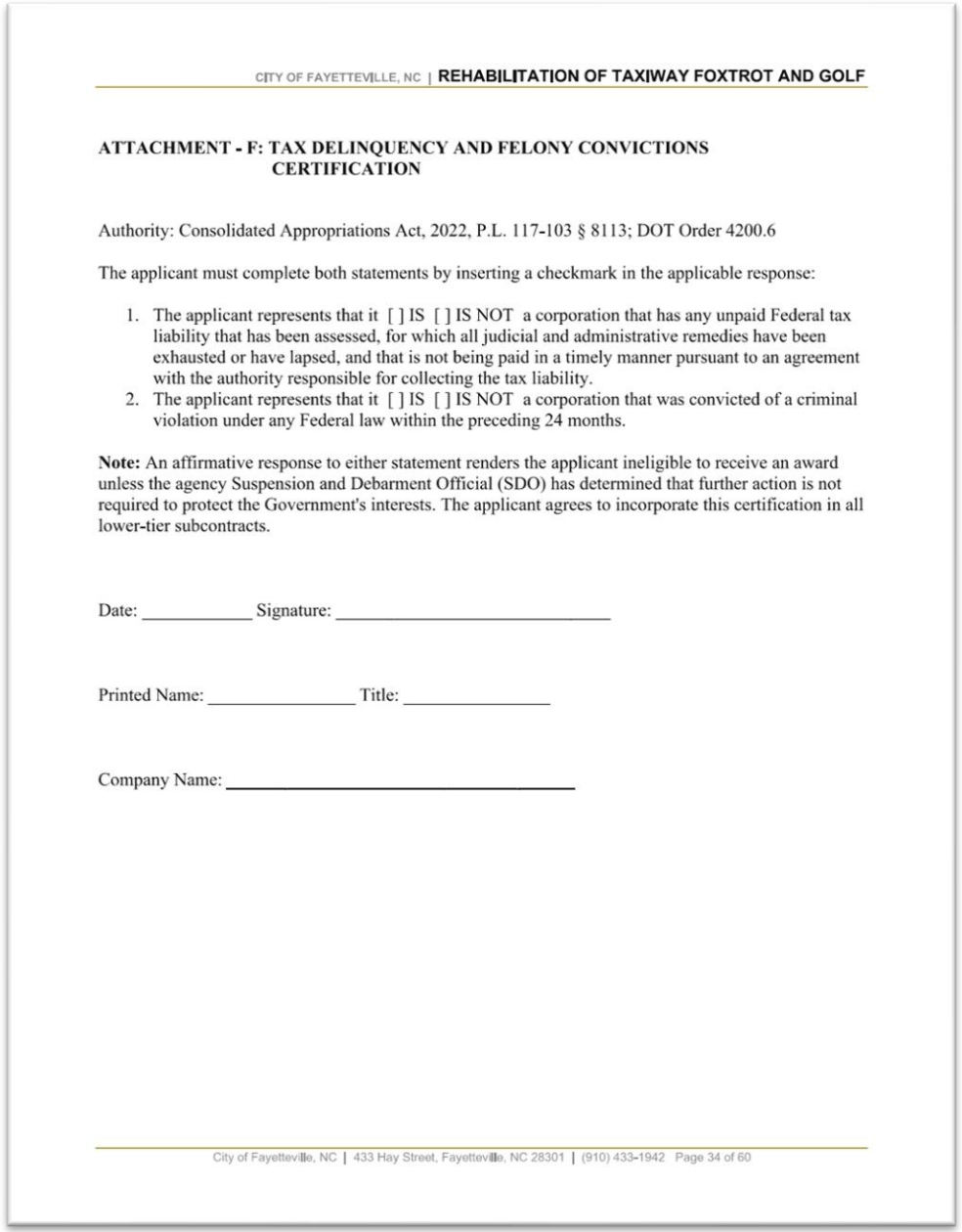
Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

Attachment F: Tax Delinquency and Felony Convictions Certification

- Indicates that applicant represents a corporation that does not have unpaid federal tax liability
- Indicates that applicant represents a corporation that was not convicted of a criminal violation under any Federal law within the preceding 24 months



ATTACHMENT - F: TAX DELINQUENCY AND FELONY CONVICTIONS CERTIFICATION

Authority: Consolidated Appropriations Act, 2022, P.L. 117-103 § 8113; DOT Order 4200.6

The applicant must complete both statements by inserting a checkmark in the applicable response:

1. The applicant represents that it [ ] IS [ ] IS NOT a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
2. The applicant represents that it [ ] IS [ ] IS NOT a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note: An affirmative response to either statement renders the applicant ineligible to receive an award unless the agency Suspension and Debarment Official (SDO) has determined that further action is not required to protect the Government's interests. The applicant agrees to incorporate this certification in all lower-tier subcontracts.

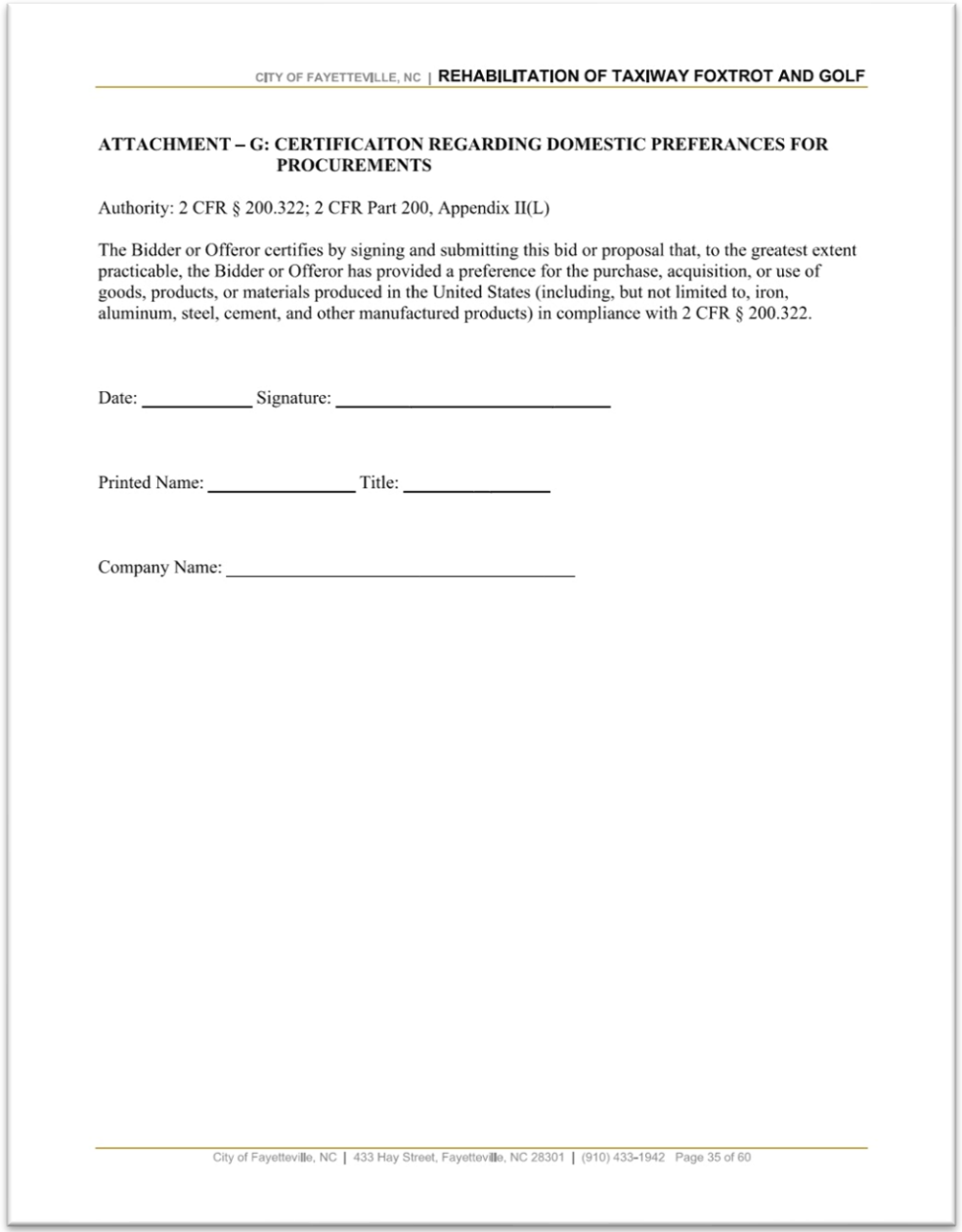
Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

Attachment G: Certification Regarding Domestic Preferences for Procurements

- Confirms the bidder or offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States in compliance with 2 CFR § 200.322



ATTACHMENT – G: CERTIFICAITON REGARDING DOMESTIC PREFERANCES FOR PROCUREMENTS

Authority: 2 CFR § 200.322; 2 CFR Part 200, Appendix II(L)

The Bidder or Offeror certifies by signing and submitting this bid or proposal that, to the greatest extent practicable, the Bidder or Offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including, but not limited to, iron, aluminum, steel, cement, and other manufactured products) in compliance with 2 CFR § 200.322.

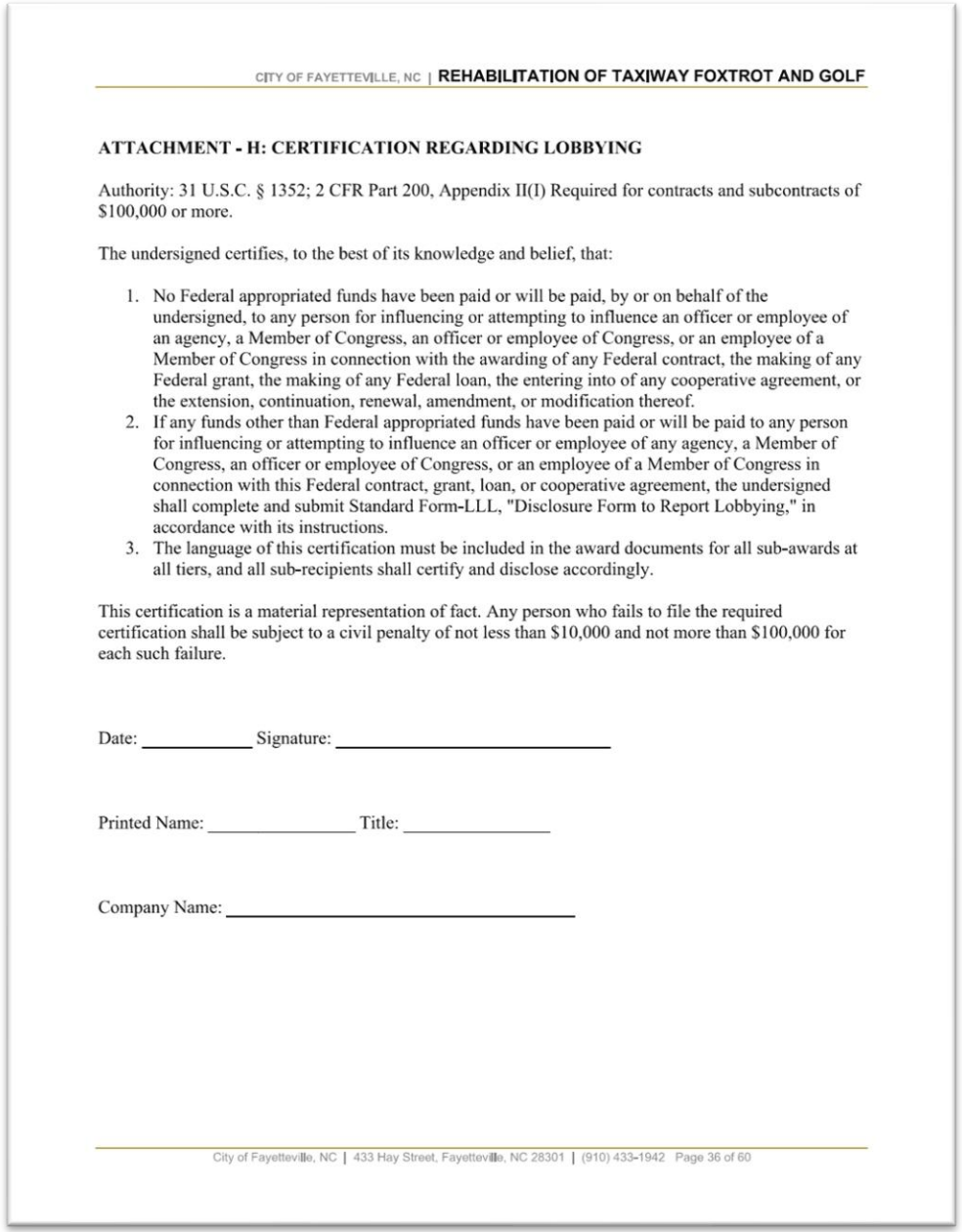
Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

Attachment H: Certification Regarding Lobbying

- Certifies that no federal funds have been or will be used to influence government officials or members of congress regarding the awarding or modification of federal contracts, grants, loans, or agreements



ATTACHMENT - H: CERTIFICATION REGARDING LOBBYING

Authority: 31 U.S.C. § 1352; 2 CFR Part 200, Appendix II(I) Required for contracts and subcontracts of $100,000 or more.

The undersigned certifies, to the best of its knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, 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, or the extension, continuation, renewal, amendment, or modification thereof.
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 language of this certification must be included in the award documents for all sub-awards at all tiers, and all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact. 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.

Date: _____ Signature: _____

Printed Name: _____ Title: _____

Company Name: _____

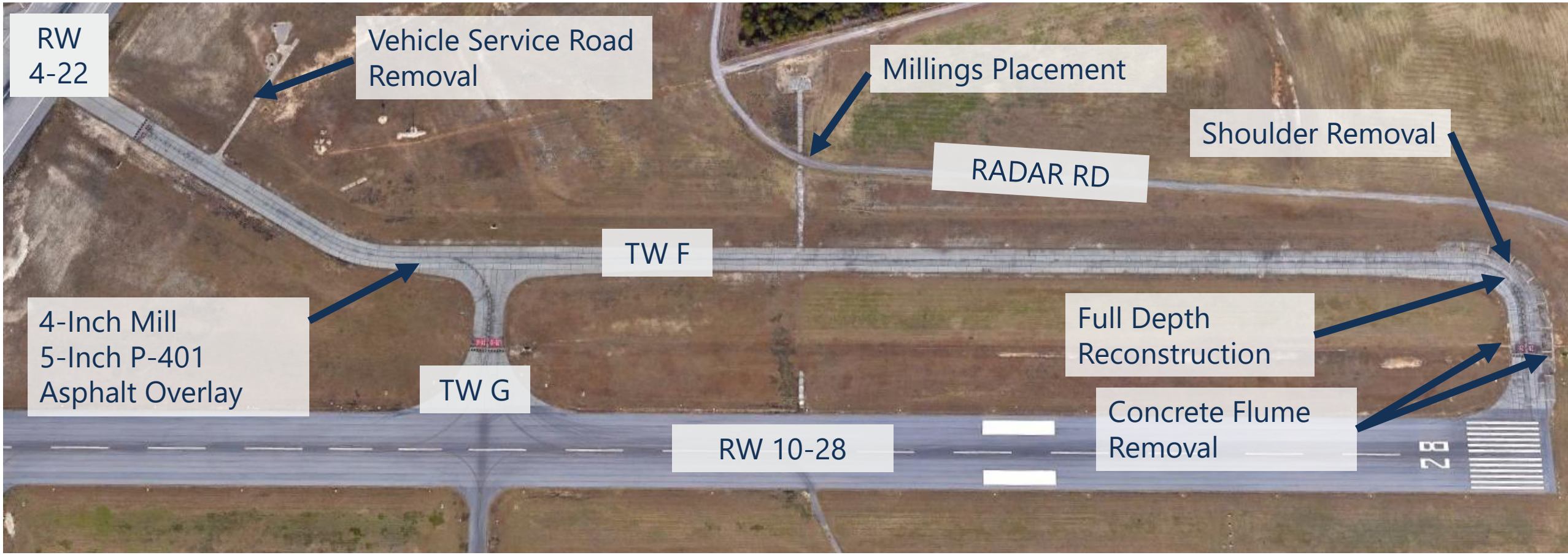
Signed City of Fayetteville General Contracting Terms

The contract documents consist of:

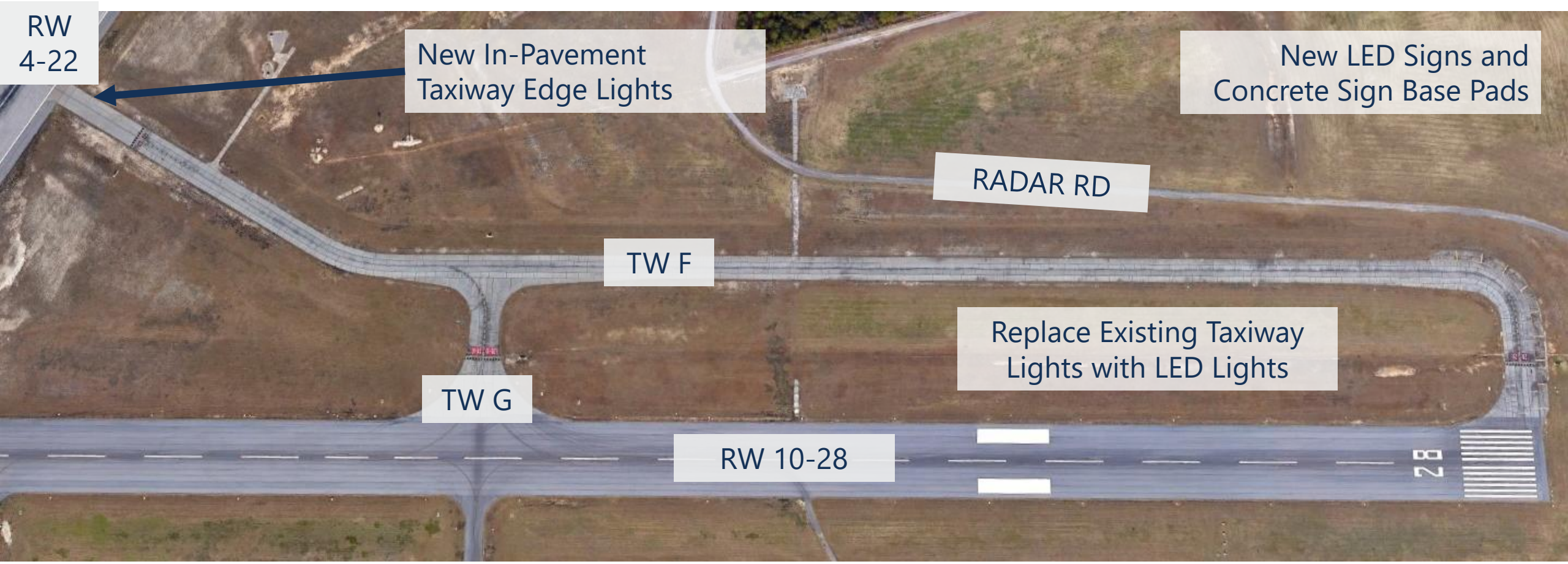
- Notice to Bidders, Instructions to Bidders, Contract Requirements, Requirements of the Work, Special Conditions if applicable;
- Drawings and Specifications, including all bulletins, addenda, or other modifications incorporated into the documents prior to their execution;
- Proposal
- Contract
- Performance Bond
- Payment Bond
- Insurance Certificates
- The approval of the City Attorney

Project Overview and Scope

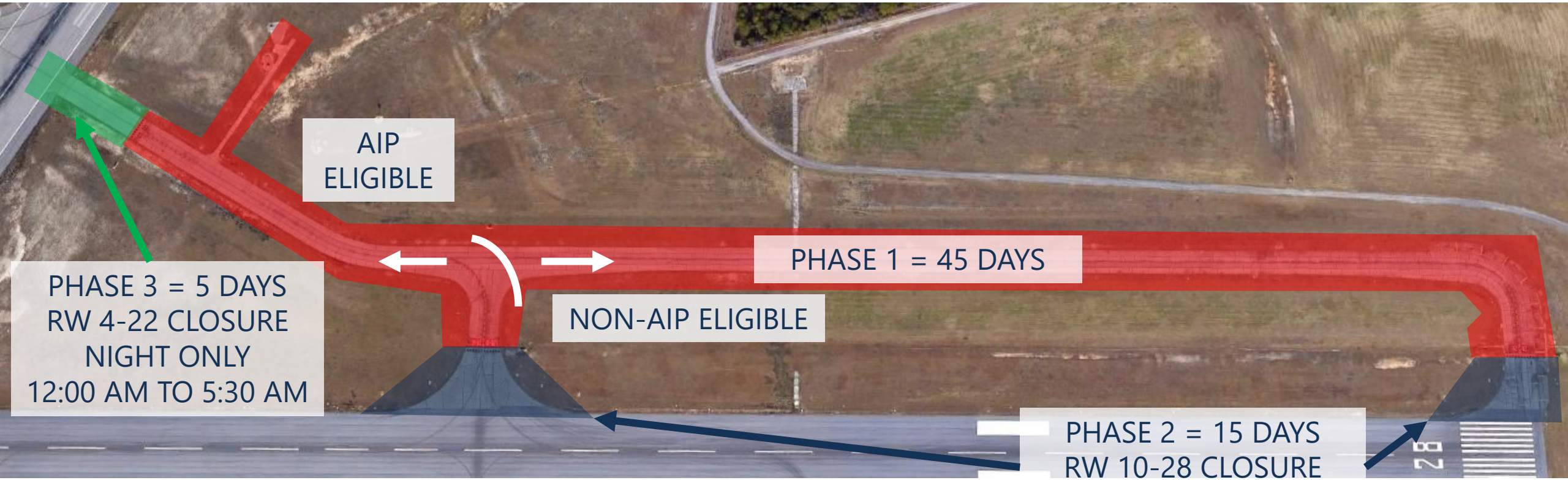
Project Scope



Project Scope

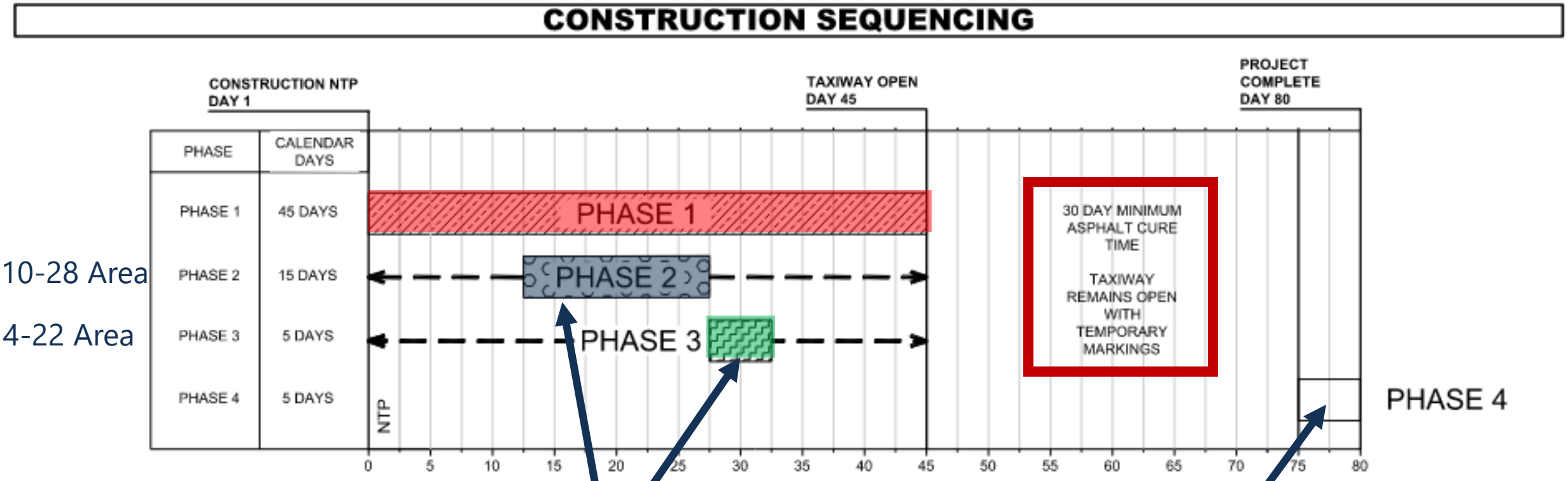


Phasing


AIP
ELIGIBLE
PHASE 1 = 45 DAYS
NON-AIP ELIGIBLE
PHASE 3 = 5 DAYS
RW 4-22 CLOSURE
NIGHT ONLY
12:00 AM TO 5:30 AM
PHASE 2 = 15 DAYS
RW 10-28 CLOSURE
NO TIME RESTRICTIONS
28

Phasing

30 Days Admin NTP
+ 80 Days Construction
110 Days Contract Time

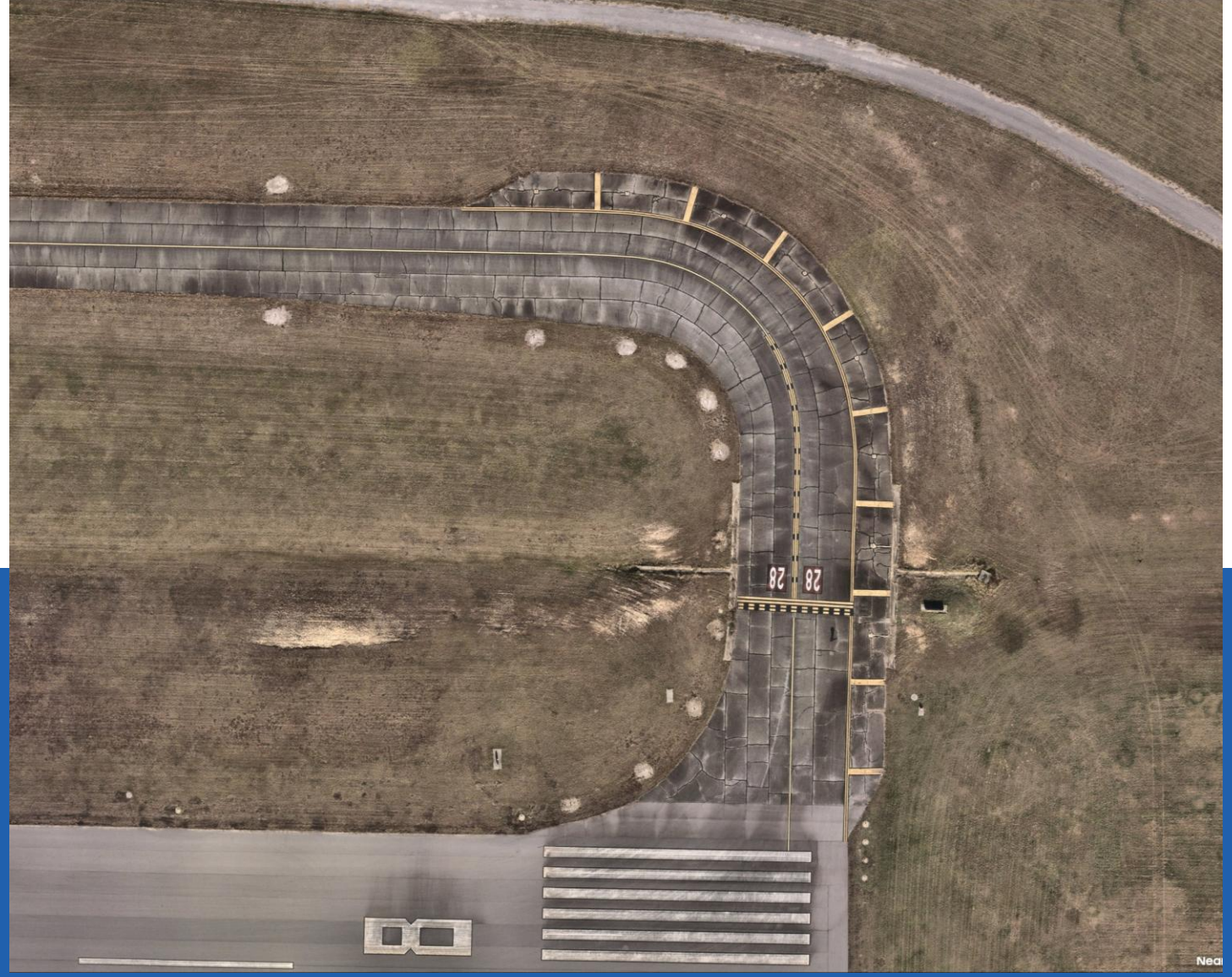


10-28 Area

4-22 Area

Phases 2 and 3
Not Concurrently
1 Runway Must be Active

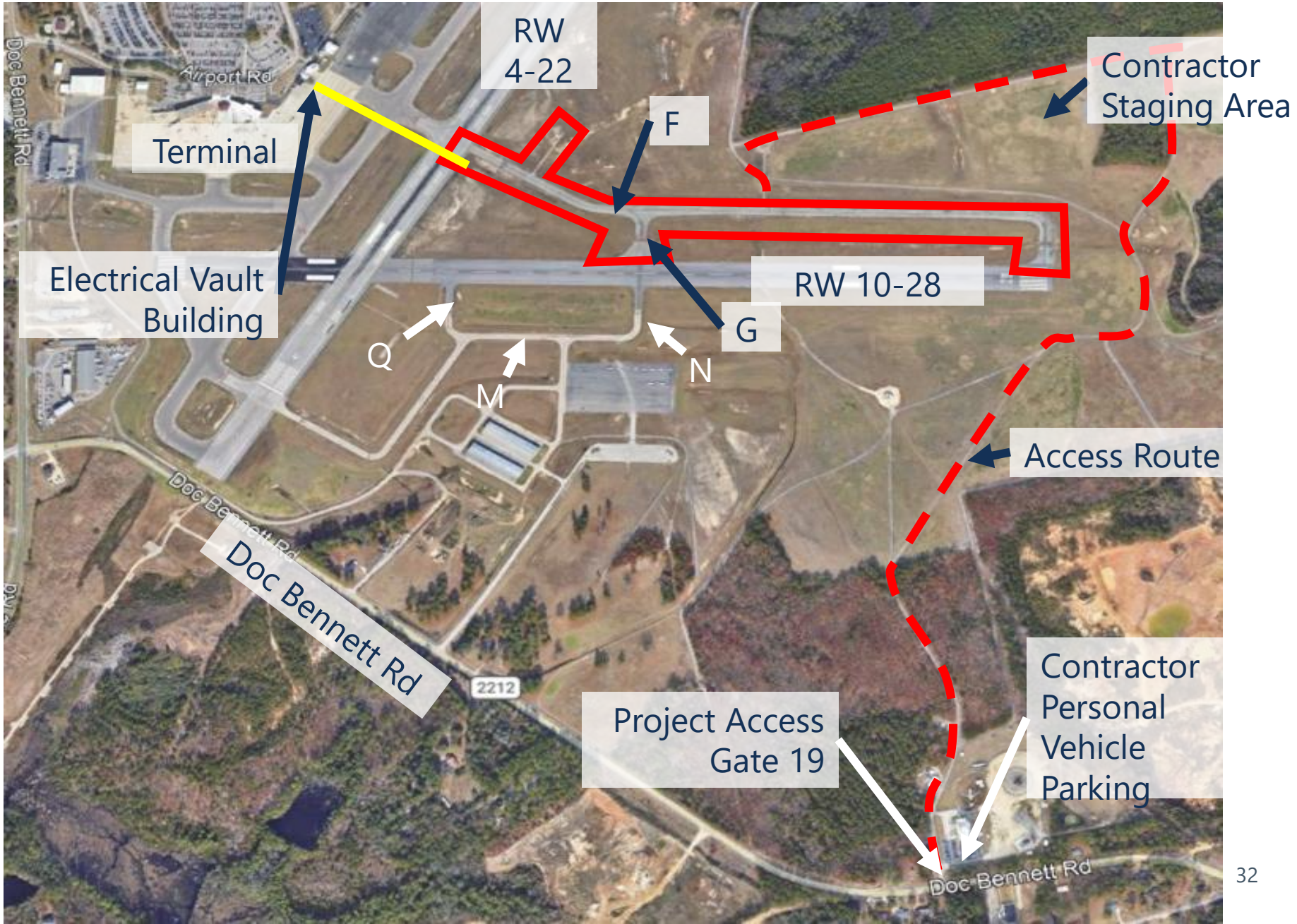
5 Days for Permanent Markings



Questions?

Questions will be recorded and responses provided in writing to all meeting participants

Site Visit


RW
4-22
Contractor
Staging Area
F
Terminal
Electrical Vault
Building
RW 10-28
G
Q
M
N
Access Route
Doc Bennett Rd
2212
Project Access
Gate 19
Contractor
Personal
Vehicle
Parking
Doc Bennett Rd
Airport Rd
Doc Bennett Rd

FAYETTEVILLE NC
AMERICA'S CAN DO CITY

PURCHASING

June 26, 2026

MEMO TO: Prospective Bidders

FROM: Kimberly Toon, Purchasing Manager

SUBJECT: **Addendum #2:** Rehabilitation of Taxiway Foxtrot and Golf Project

DUE DATE AND TIME: **JULY 09, 2026; 2:00 p.m.**

1. The Bid Documents are hereby modified by this Addendum #2 dated June 26, 2026. To include the following changes:

SPECIFICATIONS:

a. **L-108 Underground Power Cable for Airports**
   i. **Revised to include item *L-108-3 3/4" x 10' Copper Clad Ground Rod - Supplemental*.**
b. **L-125 - Installation of Airport Lighting Systems**
   i. **Revised Section 125-5.1 to clarify that item L-125-7 is the contractor's cost associated with coordinating the recalibration of the existing Constant Current Regulator.**
   ii. **Revised to include item *L-125-8 CCR Re-calibration Coordination with ADB-Safegate – Manufacturer*.**
c. **Invitation to Bid**
   i. **Revised list of pay items.**

PLANS:

d. **Sheet C001 – Index of Sheets and Summary of Quantities**
   i. **Added pay item *L-108-3 3/4" x 10' Copper Clad Ground Rod – Supplemental.***
   ii. **Revised pay item *L-125-7 CCR Re-Calibration Coordination with ADB-Safegate – Contractor.***
   iii. **Added pay item *L-125-8 CCR Re-calibration Coordination with ADB-Safegate – Manufacturer.***

2. The foregoing changes shall be incorporated in the Bid Documents, and a copy of the Addendum #2, signed by the Bidder, must accompany the Bid to indicate the Bidder's familiarity with the changes.

BIDDER'S QUESTIONS:

1. *Sign 5 is illustrated as a 4-module sign but the sign legend on side A will fit 3 modules. Since there is no bid item for a 4-module sign making it 3-modules allows the sign to be priced under bid item L-125-6.*
    a. **Engineer takes no exceptions for Sign 5 to be a 3 module sign rather than a 4 module sign, provided the manufacturer can fit the sign legend on 3 modules.**

2. *Will you please confirm that the airport wants mode 3 signs?*
    a. **Provide mode 3 signs per plans.**

3. *What are the badging requirements? Is there training required to obtain a badge? And will there be necessary SIDA access for the project?*
    a. **There is an airport provided training course to obtain a badge. The badge will grant SIDA access but will not grant movement access. Access to the electrical vault must be coordinated with the airport.**

4. *After night closure within the Runway 4-22 RSA, will a post-shift FOD inspection have to be conducted?*
    a. **Yes. Airport Operations Personnel will inspect the construction site prior to the reopening of any closed active taxiway, runway, and apron.**

5. *Will a trailer be necessary for the RPR?*
    a. **No trailer will be necessary for the RPR.**

6. *Is P-501 included in the project?*
    a. **P-501 is not included in the project.**

7. *Are all millings to be placed on Radar Road?*
    a. **All millings are to be placed at designated locations on Radar Road based on the Millings Placement Plan (Sheet C111 in the Bidding Documents).**

8. *In regard to this project, L-125-7 CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE indicates "include all work associated with coordinating and supporting the CCR manufacturer to complete all re-calibration of the CCR, including, but not limited to, fees, site visit expenses, manufacturer escort access to AOA, hardware modifications if directed by the manufacturer, and all other incidentals required in the field necessary to complete this item." As this is proprietary/sole source to one manufacturer, it will need to be procured outside of this Federally Funded project per AIP Guidelines, Handbook 5100-38D Change 1, 3-36 Limited Noncompetitive Proposal Situations (Sole Source…).*
    a. **Item L-125-7 revised per this addendum. See attached specification.**

9. *Sheet E306 Note 3 calls out a supplemental ground rod line item. Can this line item be provided?*
    a. **Engineer will provide a line item and estimate for Supplemental Ground Rods per this addendum.**

10. *Would it be possible to conduct the 2W2" directional drill under Runway 4-22 during a daytime runway closure? This would significantly help reduce the cost of directional drilling.*
    a. **No daytime runway closures of Runway 4-22 are permitted. All work on Runway 4-22 must be completed during night time hours from 12:00 AM to 5:30 AM.**

11. *Can more information be provided regarding the current condition of the CCR's slated to be recalibrated by ADB Safegate? Can the recalibration of the CCR's be performed by the contractor through coordination with ADB Safegate, or must ADB Safegate be on-site to perform the recalibration of the CCR's?*
    a. **One CCR is to be re-calibrated. The CCR is a ferroresonant type CCR and is part of a Switchgear Regulator System and is in working condition. ADB Safegate must be on-site to perform the recalibration of the CCR. See attached specification for more information.**

Attachments: List of Pay Items, L-108, L-125, C001

Bidder Acknowledgement:

Bidder Name (Print):_____

Bidder Signature:_____

Date of Signature:_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
C-100-1	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	1	LS	$_____	$_____
C-105-1	MOBILIZATION	1	LS	$_____	$_____
GP-102-1	SAFETY AND SECURITY	1	LS	$_____	$_____
GP-103-1	TEMPORARY CONSTRUCTION ITEMS	1	LS	$_____	$_____
P-101-1	ASPHALT SHOULDER FULL DEPTH PAVEMENT REMOVAL (1.5-INCH DEPTH)	1,100	SY	$_____	$_____
P-101-2	VEHICLE SERVICE ROAD FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	430	SY	$_____	$_____
P-101-3	ASPHALT TAXIWAY FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	625	SY	$_____	$_____
P-101-4	COLD MILLING	24,770	SY	$_____	$_____
P-101-5	MILLINGS PLACEMENT FOR RADAR ROAD (COMPACTED IN PLACE)	14,040	SY	$_____	$_____
P-101-6	CONCRETE FLUME REMOVAL	140	SY	$_____	$_____
C-102-1	TEMPORARY SEEDING AND MULCHING	2,915	SY	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
C-102-2	INSTALLATION AND REMOVAL OF COMPOST SOCK	700	LF	$_____	$_____
C-102-3	INSTALLATION AND REMOVAL OF ROCK PIPE INLET PROTECTION	1	EA	$_____	$_____
C-102-4	INSTALLATION AND REMOVAL OF DROP INLET PROTECTION	2	EA	$_____	$_____
D-701-1	18-INCH CORRUGATED METAL PIPE	35	LF	$_____	$_____
P-152-1	UNCLASSIFIED EXCAVATION	125	CY	$_____	$_____
P-152-2	UNSUITABLE EXCAVATION	25	CY	$_____	$_____
P-152-3	SUBGRADE PREPARATION	890	SY	$_____	$_____
P-209-1	CRUSHED AGGREGATE BASE COURSE (5-INCH DEPTH)	890	SY	$_____	$_____
P-401-1	ASPHALT SURFACE COURSE (GRADATION 2)	8,470	TN	$_____	$_____
P-401-2	ASPHALT LEVELING COURSE (GRADATION 3)	25	TN	$_____	$_____
P-602-1	EMULSIFIED ASPHALT PRIME COAT	12,840	GA	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
P-603-1	EMULSIFIED ASPHALT TACK COAT	2,140	GA	$_____	$_____
P-620-1	SURFACE PREPARATION	3,694	SF	$_____	$_____
P-620-2	WHITE REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	300	SF	$_____	$_____
P-620-3	WHITE REFLECTIVE MARKING (TYPE III WATERBORNE PAINT)	3,820	SF	$_____	$_____
P-620-4	YELLOW REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	3,230	SF	$_____	$_____
P-620-5	RED REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	1,140	SF	$_____	$_____
P-620-6	BLACK NON-REFLECTIVE MARKING (TYPE I WATERBORNE PAINT, NO GLASS BEADS)	14,120	SF	$_____	$_____
P-620-7	TYPE I GLASS BEADS, GRADATION A, REFLECTIVE MEDIA	70	LB	$_____	$_____
P-620-8	TYPE III GLASS BEADS, REFLECTIVE MEDIA	620	LB	$_____	$_____
T-901-1	SEEDING	0.4	AC	$_____	$_____
T-905-1	TOPSOIL OBTAINED ON SITE	139	CY	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
T-904-1	SODDING	795	SY	$_____	$_____
T-908-1	MULCHING	1,709	SY	$_____	$_____
L-105-1	REMOVE EXISTING STAKE MOUNTED LIGHT FIXTURE	69	EA	$_____	$_____
L-105-2	REMOVE EXISTING BASE MOUNTED LIGHT FIXTURE AND BASE CAN	12	EA	$_____	$_____
L-105-3	REMOVE EXISTING IN-PAVEMENT LIGHT FIXTURE AND BASE CAN IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-105-4	REMOVE EXISTING SIGN AND FOUNDATION	8	EA	$_____	$_____
L-105-5	MISCELLANEOUS ELECTRICAL DEMOLITION	1	LS	$_____	$_____
L-108-1	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS (INITIAL AND SUPPLEMENTAL) AND GROUND CONNECTORS	10,255	LF	$_____	$_____
L-108-2	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE	14,600	LF	$_____	$_____
L-108-3	3/4" x 10' COPPER CLAD GROUND ROD - SUPPLEMENTAL	140	EA	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
L-110-1	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED IN TURF	9,400	LF	$_____	$_____
L-110-2	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED UNDER MILL/OVERLAY PAVEMENT	30	LF	$_____	$_____
L-110-3	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – CONCRETE ENCASED UNDER MILL/OVERLAY PAVEMENT	175	LF	$_____	$_____
L-110-4	2 WAY 2-INCH SCHEDULE 40 PVC CONDUIT - DIRECT EARTH BURIED	650	LF	$_____	$_____
L-110-5	2 WAY 2-INCH SCHEDULE 80 HDPE DIRECTIONAL DRILL	400	LF	$_____	$_____
L-115-1	JUNCTION CAN PLAZA - 2 L-867D BASE CANS	6	EA	$_____	$_____
L-125-1	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN TURF	89	EA	$_____	$_____
L-125-2	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-125-3	REINSTALL EXISTING IN-PAVEMENT LIGHT FIXTURE ON NEW BASE CAN IN MILL/OVERLAY PAVEMENT	2	EA	$_____	$_____
L-125-4	L-858(L) LED SIGN, 1-MODULE ON A NEW CONCRETE SIGN BASE	3	EA	$_____	$_____

Item No.	Item Description	Estimated Quantity		Unit Price in Numbers	Total Amount per Item
L-125-5	L-858(L) LED SIGN, 2-MODULE ON A NEW CONCRETE SIGN BASE	2	EA	$_____	$_____
L-125-6	L-858(L) LED SIGN, 3-MODULE ON A NEW CONCRETE SIGN BASE	3	EA	$_____	$_____
L-125-7	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE - CONTRACTOR	1	LS	$_____	$_____
L-125-8	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE - MANUFACTURER	1	AL	$_____	$_____

This Bid Package is executed by:

ITEM	DETAILS
Name / Title:	
Company Name:	
Mailing Address:	
Email:	
Signature:	
Phone Number:	
NC Contractor License No.:	
License Classification / Limitation:	
Total Bid Amount (figures):	$
Total Bid Amount (written):	

ACKNOWLEDGEMENT OF ADDENDA

The bidder has received, acknowledged, and incorporated the following addenda in completing this Bid. (Written Initials and date as appropriate.)

ITEM	DETAILS
Addendum No. 1:	Dated: _____
Addendum No. 2:	Dated: _____
Addendum No. 3:	Dated: _____
Addendum No. 4:	Dated: _____

Item L-108 Underground Power Cable for Airports

The following items in red are changes associated with Addendum 2

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the RPR. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.

EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, Maintenance Airport Visual Aid Facilities, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #8 American wire gauge (AWG), L-824 Type C , 5,000 volts, non-shielded, with cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 Type C , 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type XHHW, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, XHHW, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of XHHW 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet long and 3/4 inch in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

b. The field-attached plug-in splice. Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport

cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 Flowable backfill. Not used.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable

runs without connections unless otherwise authorized in writing by the RPR or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor’s expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall

be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

~~**a. Trenching.** Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:~~

~~When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.~~

~~Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.~~

~~The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.~~

~~When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill material may alternatively be used.~~

~~Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.~~

~~It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:~~

~~**(1)** Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.~~

~~**(2)** Trenching, etc., in cable areas shall then proceed, with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.~~

~~In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair or replacement.~~

~~**b. Backfilling.** After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches (125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.~~

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557.

Trenches shall not contain pools of water during backfilling operations. The trench shall be completely backfilled and tamped level with the adjacent surface, except that when turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.

Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the RPR. If not shown on the plans, the warning tape shall be located 6 inches (150 mm) above the direct-buried cable or the counterpoise wire if present. A 3-6 inch (75 - 150 mm) wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches (200 mm) minimum below finished grade.

c. Restoration. Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the **sodding** and seeding as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557. Restoration shall be considered incidental to the pay item of which it is a component part.

108-3.4 Cable markers for direct-buried cable. The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet (60 cm) square and 4-6 inch (10 - 15 cm) thick, extending approximately one inch (25 mm) above the surface. Each cable run from a line of lights and signs to the equipment vault shall be marked at approximately every 200 feet (61 m) along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word “CABLE” and directional arrows on each cable marking slab. The letters shall be approximately 4 inches (100 mm) high and 3 inches (75 mm) wide, with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.

At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word “SPLICE” on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the RPR. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or splice markers shall be given one coat of high-visibility aviation orange paint as approved by the RPR. Furnishing and installation of cable markers is incidental to the respective cable pay item.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer’s instructions and to the satisfaction of the RPR.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer’s instructions. These splices shall be made by plugging directly into mating connectors. The joint

where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) Wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer’s instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer’s recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch (6.4 mm) beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials

used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. [Not used]

b. Isolation. Counterpoise size is as shown on the plans. The isolation method is an alternate method for use only with edge lights installed in turf and stabilized soils and raceways installed parallel to and adjacent to the edge of the pavement. NFPA 780 uses 15 feet to define "adjacent to".

The counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable being protected.

The counterpoise conductor shall be installed 8 inches (203 mm) minimum below grade. The counterpoise is not connected to the light base or mounting stake. An additional grounding electrode is required at each light base or mounting stake. The grounding electrode is bonded to the light base or mounting stake with a 6 AWG solid copper conductor.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Isolation Method of lightning protection.

c. Common Installation requirements. When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M™ Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the RPR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the RPR. All such testing shall be at the sole expense of the Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The RPR shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the RPR the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than **100** megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the RPR prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the RPR. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved “repair” procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 Cable or counterpoise wire installed in duct bank or conduit shall be measured by the number of linear feet of cable or counterpoise wire installed in trenches, duct bank, or conduit, including ground rods and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack. This measurement shall include an additional supplemental ground rod required if the first ground rod does not reach ground resistance requirements. Cable and counterpoise slack is considered incidental to this item and is included in the Contractor’s unit price. No separate measurement or payment will be made for cable or counterpoise slack.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for cable, bare counterpoise, and equipment ground installed in duct bank or conduit, and any required additional supplemental ground rods installed, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

L-108-1	No. 6 AWG, Solid, Bare Counterpoise Wire, Installed in Trench, Above the Duct Bank or Conduit, Including Ground Rods (Initial and Supplemental) and Ground Connectors	per linear foot
L-108-2	No. 8 AWG, 5 kV, L-824, Type C Cable	per linear foot
L-108-3	3/4" x 10' Copper Clad Ground Rod - Supplemental	per each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes

ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Federal Aviation Administration Standard

FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment

END OF ITEM L-108

Item L-125 Installation of Airport Lighting Systems

The following items in red are changes associated with Addendum 2

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in an electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all

equipment, materials or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Concrete. All concrete used in structures must conform to the requirements of Item P-610, Concrete for Miscellaneous Structures.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Retroreflective markers shall be type L-853 and shall conform to

the requirements of AC 150/5345-39.

125-2.7 Taxiway Edge Lights. Taxiway edge lights shall conform to the requirements of FAA AC 150/5345-46, latest edition TYPE L-861T. Taxiway edge fixture lamps shall be LED type with properly sized transformer at the locations indicated on the plans. Taxiway edge lights shall be installed at the locations indicated in the plans in accordance with the details.

125-2.8 Guidance Signs. Guidance Signs shall conform to the requirements of FAA AC 150/5345-44 latest edition TYPE L-858 Y, R, L, and B. Guidance signs shall be of size and type as indicated on the details in the plans with LED type engines. The signs shall be installed at the locations indicated in the plans in accordance with the details with the messages as shown on the sign schedule.

125-2.9 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867, Class 1A, Size shall be as shown on plans. Base cans shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.10 Isolation Transformers. Isolation Transformers shall be Type L-830 , size as required for each installation. Transformer shall conform to AC 150/5345-47.

125-2.11 Constant Current Regulators. Not used.

125-2.17 Basis Of Design. The airfield lighting systems are designed using the below listed maximum fixture wattages. Approved airfield lighting fixtures with higher wattages are permissible provided the Contractor assumes all costs for the redesign of the airfield lighting and necessary power distribution systems and all costs incurred furnishing and installing any additional

equipment. In no case shall the Contractor be allowed to reduce the size of the constant current regulators or the power distribution systems.

L-861T Taxiway Edge Light - LED (Elevated)
21 W
L-861T Taxiway Edge Light - Incandescent (Elevated)
42 VA

L-858Y,R,L - LED

Location, Information, Boundary, Destination Mandatory Sign	1 Module	100 VA	
	2 Module	100 VA	
	3 Module	110 VA	
	4 Module	110 VA	

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

Require the Contractor to furnish all necessary equipment and appliances for testing the underground cables, counterpoise, and safety ground in accordance with Item L-108, Underground Power Cable for Airports and L-131.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

125-3.5 Maintenance Of Airport Lighting Systems. The Contractor shall maintain the airport lighting systems during the various phases of the work as shown on the phasing plan(s) or as directed by the Engineer. The Contractor shall be responsible for all temporary connections in the field or at the regulator necessary for operation of the circuits during construction.

125-3.6 Restoration. After the backfill is completed, the contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. The restoration shall include top soiling, seeding, and mulching. The Contractor shall grade around structures as required to provide positive drainage away from the structure. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacement until final acceptance. All restoration shall be considered incidental to the item for which it applies.

125-3.7 Inspection. Inspect each light fixture, marker, and sign to determine that it is installed correctly, at the proper height, in line with the other fixtures, level, and properly oriented.

Check all fixture, marker, and sign securing screws or bolts to ensure that they have been tightened per manufacturer's recommendations. Use an anti-seize compound on bolts made of stainless steel.

Check each fixture, marker, and sign to determine that the lenses and panels are clean and unscratched.

Check identification numbers for each light fixture and sign to determine that the number at the installation is assigned in the plans or by the Owner's direction.

Check equipment covered by FAA specifications to determine if the manufacturers have supplied certified equipment. Also check equipment for general conformance with the specification requirements.

Check base plates for damage during installation and refinish according to manufacturer's instructions.

METHOD OF MEASUREMENT

125-4.1 Taxiway lights and guidance signs will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR. In-Pavement Light Fixtures reinstalled on existing base cans will be measured by the number installed as completed units in place, ready for operation, and accepted by the RPR.

125-4.2 Measurement for the coordination of re-calibrating the existing Constant Current Regulator will be per lump sum. This will include all work associated with coordinating and supporting the CCR manufacturer to complete all re-calibration of the CCR, including, but not limited to, fees, site visit expenses, manufacturer escort access to AOA, hardware modifications if directed by the manufacturer, and all other incidentals required in the field necessary to complete this item in accordance with these specifications, installation details shown on the plan drawings, and as directed by the RPR.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete light fixture, guidance sign, installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Taxiway edge light units include fixtures, stems, frangible couplings, base cans, base plates, gaskets, isolation transformers, grounding connections, ground rods, excavation, backfill, restoration, testing, and incidental items required to provide a functioning unit in accordance with the Contract Documents.

Item L-125-7: Payment will be made at the contract lump sum unit price for the contractor's cost associated with coordinating the re-calibration of the existing Constant Current Regulator with the manufacturer ADB Safegate. This price will be full compensation for furnishing all necessary materials by the contractor and for any ~~all~~ preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals by the contractor necessary to complete the item, including all coordination, fees, and site visit expenses required by the CCR manufacturer.

Item L-125-8: Payment will be made under the ALCMS vendor allowance pay item. This shall include work necessary to complete a complete re-calibration of the existing CCR including, but not limited to, fees, site visit expenses, manufacturer escort access to AOA, hardware modifications if directed by the manufacturer, and all other incidentals required in the field necessary to complete this item in accordance with these specifications, installation details shown on the plan drawings, and as directed by the RPR.

Payment will be made under:

L-125-1	L-861T(L) LED Taxiway Edge Light – Base Mounted in Turf	per each
L-125-2	L-861T(L) LED Taxiway Edge Light – Base Mounted in Mill/Overlay Pavement	per each
L-125-3	Reinstall Existing In-Pavement Light Fixture On New Base Can In Mill/Overlay Pavement	per each
L-125-4	L-858(L) LED Sign, 1-Module on a New Concrete Sign Base	per each
L-125-5	L-858(L) LED Sign, 2-Module on a New Concrete Sign Base	per each
L-125-6	L-858(L) LED Sign, 3-Module on a New Concrete Sign Base	per each

L-125-7	CCR Re-calibration Coordination with ADB-Safegate - Contractor	per lump sum
L-125-8	CCR Re-calibration Coordination with ADB-Safegate - Manufacturer	per allowance

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program

Engineering Brief (EB)

EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

CIVIL DRAWINGS

SHEET #	SHEET TITLE
C000	COVER SHEET
C001	INDEX OF DRAWINGS AND SUMMARY OF QUANTITIES
C011	SAFETY AND SECURITY NOTES AND DETAILS
C012	CONTRACTOR ACCESS PLAN
C013	PART 77 AIRSPACE PLAN
C014	CONTRACTOR PHASING PLAN
C015	TEMPORARY RUNWAY CLOSURE PLAN
C020	HORIZONTAL AND VERTICAL CONTROL PLAN
C100	DEMOLITION KEY MAP
C101	DEMOLITION PLAN (1 OF 5)
C102	DEMOLITION PLAN (2 OF 5)
C103	DEMOLITION PLAN (3 OF 5)
C104	DEMOLITION PLAN (4 OF 5)
C105	DEMOLITION PLAN (5 OF 5)
C111	MILLINGS PLACEMENT PLAN
C200	PAVING KEY MAP
C201	PAVING PLAN (1 OF 5)
C202	PAVING PLAN (2 OF 5)
C203	PAVING PLAN (3 OF 5)
C204	PAVING PLAN (4 OF 5)
C205	PAVING PLAN (5 OF 5)
C210	TAXIWAY F & G PLAN AND PROFILE KEY MAP
C211	TAXIWAY F PLAN AND PROFILE (1 OF 7)
C212	TAXIWAY F PLAN AND PROFILE (2 OF 7)
C213	TAXIWAY F PLAN AND PROFILE (3 OF 7)
C214	TAXIWAY F PLAN AND PROFILE (4 OF 7)
C215	TAXIWAY F PLAN AND PROFILE (5 OF 7)
C216	TAXIWAY F PLAN AND PROFILE (6 OF 7)
C217	TAXIWAY F PLAN AND PROFILE (7 OF 7)
C218	TAXIWAY G PLAN AND PROFILE
C231	TYPICAL SECTIONS (1 OF 2)
C232	TYPICAL SECTIONS (2 OF 2)
C300	GRADING KEY MAP
C301	GRADING PLAN (1 OF 5)
C302	GRADING PLAN (2 OF 5)
C303	GRADING PLAN (3 OF 5)
C304	GRADING PLAN (4 OF 5)
C305	GRADING PLAN (5 OF 5)
C311	INTERMEDIATE ELEVATION PLAN - TIE-INS
C320	FINAL ELEVATION KEY MAP
C321	FINAL ELEVATION PLAN (1 OF 5)
C322	FINAL ELEVATION PLAN (2 OF 5)
C323	FINAL ELEVATION PLAN (3 OF 5)
C324	FINAL ELEVATION PLAN (4 OF 5)
C325	FINAL ELEVATION PLAN (5 OF 5)
C400	PAVEMENT MARKING KEY MAP
C401	PAVEMENT MARKING PLAN (1 OF 5)
C402	PAVEMENT MARKING PLAN (2 OF 5)
C403	PAVEMENT MARKING PLAN (3 OF 5)
C404	PAVEMENT MARKING PLAN (4 OF 5)
C405	PAVEMENT MARKING PLAN (5 OF 5)
C431	PAVEMENT MARKING DETAILS
C531	EROSION CONTROL NOTES
C532	EROSION CONTROL DETAILS (1 OF 3)
C533	EROSION CONTROL DETAILS (2 OF 3)
C534	EROSION CONTROL DETAILS (3 OF 3)

ELECTRICAL DRAWINGS

SHEET #	SHEET TITLE
E001	ELECTRICAL GENERAL NOTES
E101	ELECTRICAL DEMOLITION PLAN
E102	ELECTRICAL DEMOLITION PLAN
E103	ELECTRICAL DEMOLITION PLAN
E104	ELECTRICAL DEMOLITION PLAN
E105	ELECTRICAL DEMOLITION PLAN
E106	ELECTRICAL DEMOLITION PLAN
E201	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E202	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E203	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E204	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E205	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E206	ELECTRICAL LAYOUT AND CIRCUITING PLAN
E301	ELECTRICAL DETAILS
E302	ELECTRICAL DETAILS
E303	ELECTRICAL DETAILS
E304	ELECTRICAL DETAILS
E305	ELECTRICAL DETAILS
E306	ELECTRICAL DETAILS
E307	ELECTRICAL DETAILS
E308	ELECTRICAL DETAILS

SUMMARY OF QUANTITIES

ITEM NO.	ITEM DESCRIPTION	AIP ELIGIBLE	NON-AIP ELIGIBLE	TOTAL QUANTITY	UNIT
	CIVIL QUANTITIES				
C-100-1	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	0.5	0.5	1	LS
C-105-1	MOBILIZATION	0.5	0.5	1	LS
GP-102-1	SAFETY AND SECURITY	0.5	0.5	1	LS
GP-103-1	TEMPORARY CONSTRUCTION ITEMS	0.5	0.5	1	LS
P-101-1	ASPHALT SHOULDER FULL DEPTH PAVEMENT REMOVAL (1.5-INCH DEPTH)	0	1100	1100	SY
P-101-2	VEHICLE SERVICE ROAD FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	430	0	430	SY
P-101-3	ASPHALT TAXIWAY FULL DEPTH PAVEMENT REMOVAL (UP TO 9-INCH DEPTH)	0	625	625	SY
P-101-4	COLD MILLING	10270	14500	24770	SY
P-101-5	MILLINGS PLACEMENT FOR RADAR ROAD (COMPACTED IN PLACE)	14040	0	14040	SY
P-101-6	CONCRETE FLUME REMOVAL	0	140	140	SY
C-102-1	TEMPORARY SEEDING AND MULCHING	425	2490	2915	SY
C-102-2	INSTALLATION AND REMOVAL OF COMPOST SOCK	0	700	700	LF
C-102-3	INSTALLATION AND REMOVAL OF ROCK PIPE INLET PROTECTION	0	1	1	EA
C-102-4	INSTALLATION AND REMOVAL OF DROP INLET PROTECTION	1	1	2	EA
D-701-1	18-INCH CORRUGATED METAL PIPE	35	0	35	LF
P-152-1	UNCLASSIFIED EXCAVATION	0	125	125	CY
P-152-2	UNSUITABLE EXCAVATION	0	25	25	CY
P-152-3	SUBGRADE PREPARATION	0	890	890	SY
P-209-1	CRUSHED AGGREGATE BASE COURSE (5-INCH DEPTH)	0	890	890	SY
P-401-1	ASPHALT SURFACE COURSE (GRADATION 2)	3390	5080	8470	TN
P-401-2	ASPHALT LEVELING COURSE (GRADATION 3)	20	5	25	TN
P-602-1	EMULSIFIED ASPHALT PRIME COAT	5140	7700	12840	GA
P-603-1	EMULSIFIED ASPHALT TACK COAT	890	1250	2140	GA
P-620-1	SURFACE PREPARATION	3372	322	3694	SF
P-620-2	WHITE REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	200	100	300	SF
P-620-3	WHITE REFLECTIVE MARKING (TYPE III WATERBORNE PAINT)	1190	2630	3820	SF
P-620-4	YELLOW REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	1650	1580	3230	SF
P-620-5	RED REFLECTIVE MARKING (TYPE I WATERBORNE PAINT)	830	310	1140	SF
P-620-6	BLACK NON-REFLECTIVE MARKING (TYPE I WATERBORNE PAINT, NO GLASS BEADS)	6360	7760	14120	SF
P-620-7	TYPE I GLASS BEADS, GRADATION A, REFLECTIVE MEDIA	51	19	70	LB
P-620-8	TYPE III GLASS BEADS, REFLECTIVE MEDIA	274	346	620	LB
T-901-1	SEEDING	0.1	0.3	0.4	AC
T-905-1	TOPSOIL OBTAINED ON SITE	24	115	139	CY
T-904-1	SODDING	35	760	795	SY
T-908-1	MULCHING	395	1314	1709	SY
	ELECTRICAL QUANTITIES				
L-105-1	REMOVE EXISTING STAKE MOUNTED LIGHT FIXTURE	35	34	69	EA
L-105-2	REMOVE EXISTING BASE MOUNTED LIGHT FIXTURE AND BASE CAN	2	10	12	EA
L-105-3	REMOVE EXISTING IN-PAVEMENT LIGHT FIXTURE AND BASE CAN IN MILL/OVERLAY PAVEMENT	1	1	2	EA
L-105-4	REMOVE EXISTING SIGN AND FOUNDATION	4	4	8	EA
L-105-5	MISCELLANEOUS ELECTRICAL DEMOLITION	0.5	0.5	1	LS
L-108-1	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS (INITIAL AND SUPPLEMENTAL) AND GROUND CONNECTORS	4155	6100	10255	LF
L-108-2	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE	7800	6800	14600	LF
L-108-3	3/4" x 10' COPPER CLAD GROUND ROD - SUPPLEMENTAL	70	70	140	EA
L-110-1	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED IN TURF	3500	5900	9400	LF
L-110-2	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – DIRECT EARTH BURIED UNDER MILL/OVERLAY PAVEMENT	30	0	30	LF
L-110-3	1 WAY 2-INCH SCHEDULE 40 PVC CONDUIT – CONCRETE ENCASED UNDER MILL/OVERLAY PAVEMENT	75	100	175	LF
L-110-4	2 WAY 2-INCH SCHEDULE 40 PVC CONDUIT - DIRECT EARTH BURIED	550	100	650	LF
L-110-5	2 WAY 2-INCH SCHEDULE 80 HDPE DIRECTIONAL DRILL	400	0	400	LF
L-115-1	JUNCTION CAN PLAZA - 2 L-867D BASE CANS	4	2	6	EA
L-125-1	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN TURF	40	49	89	EA
L-125-2	L-861T(L) LED TAXIWAY EDGE LIGHT – BASE MOUNTED IN MILL/OVERLAY PAVEMENT	2	0	2	EA
L-125-3	REINSTALL EXISTING IN-PAVEMENT LIGHT FIXTURE ON NEW BASE CAN IN MILL/OVERLAY PAVEMENT	1	1	2	EA
L-125-4	L-858(L) LED SIGN, 1-MODULE ON A NEW CONCRETE SIGN BASE	1	2	3	EA
L-125-5	L-858(L) LED SIGN, 2-MODULE ON A NEW CONCRETE SIGN BASE	2	0	2	EA
L-125-6	L-858(L) LED SIGN, 3-MODULE ON A NEW CONCRETE SIGN BASE	1	2	3	EA
L-125-7	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE - CONTRACTOR	0.5	0.5	1	LS
L-125-8	CCR RE-CALIBRATION COORDINATION WITH ADB-SAFEGATE - MANUFACTURER	0	1	1	AL

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ABBREVIATIONS

ABC - AGGREGATE BASE COURSE
ADG - AIRPLANE DESIGN GROUP
AOA - AIRCRAFT OPERATIONS AREA
APPROX. - APPROXIMATE
ARFF - AIRCRAFT RESCUE AND FIREFIGHTING
ASTM - AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATCT - AIR TRAFFIC CONTROL TOWER
BOP - BOTTOM OF PIPE
BOD - BOTTOM OF DUCT
BOTT. - BOTTOM
CL/C- CENTERLINE
C - CONDUIT
CF - CUBIC FOOT
CKT - CIRCUIT
CLR - CLEARANCE
COM - COMMUNICATION
CONC - CONCRETE
CONN - CONNECTION
CONT - CONTINUOUS
CSSO - CONTRACTOR SAFETY AND SECURITY OFFICER
CY - CUBIC YARD
DBL - DOUBLE
DET - DETAIL
DIA - DIAMETER
DIAG. - DIAGONAL
DWG - DRAWING
E - EASTING
EA - EACH
EG - EXISTING GROUND
ELB - ELECTRIC SERVICE BOX/METER
EL/ELEV - ELEVATION
ELEC - ELECTRICAL
EMH - ELECTRIC MANHOLE
EOP - EDGE OF PAVEMENT
EX/EXST/EXIST - EXISTING
FAA - FEDERAL AVIATION ADMINISTRATION
FOD - FOREIGN OBJECT DEBRIS
FAR - FEDERAL AVIATION REGULATIONS
GL - GUTTER LINE
GND. - GROUND
GSE - GROUND SERVICE EQUIPMENT
GWL - GROUND WATER LEVEL
HORT - HORIZONTAL
I/C - NUMBER OF CONDUCTORS/CONDUCTOR
ID - IDENTIFICATION
I.D. - INNER DIAMETER
IE/INV - INVERT ELEVATION / INVERT
KIP - 1,000 LBS
kV - KILOVOLT
L - LIGHTING
LB - POUND
LED - LIGHT-EMITTING DIODE
LF - LINEAR FEET
LT - LEFT
MAX - MAXIMUM
MECH - MECHANICAL
MH - MANHOLE
MIN - MINIMUM
N - NORTHING
NAD - NORTH AMERICAN DATUM
NAVAIDS - NAVIGATIONAL AIDS
NLVR - NON-LICENSED VEHICLE ROAD
NO - NUMBER
NTP - NOTICE TO PROCEED
NTS - NOT TO SCALE
OC - ON CENTER
OD - OUTER DIAMETER
OFA - OBJECT FREE AREA
PAVT - PAVEMENT
PC - POINT OF CURVATURE
PCC - PORTLAND CEMENT CONCRETE
PERF - PERFORATED
PG - PROPOSED GRADE
PL - PLATE
PSF - POUNDS PER SQUARE FOOT
PSI - POUNDS PER SQUARE INCH
PT - POINT OF TANGENCY
PVI - POINT OF VERTICAL INTERSECTION
RCP - REINFORCED CONCRETE PIPE
REF - REFERENCE
REINF - REINFORCED
REQ/REQ'D - REQUIRED
RGL - RUNWAY GUARD LIGHTS
RIM - RIM ELEVATION
RON - REMAIN OVERNIGHT
RPZ - RUNWAY PROTECTION ZONE
RSA - RUNWAY SAFETY AREA
RT - RIGHT
RW - RUNWAY
S/SAN - SANITARY
SA - SAFETY AREA
SC - SECONDARY CONTAINMENT
SCH/SCHED - SCHEDULE
SD - STORM DRAIN
SDMH - STORM DRAIN MANHOLE
SHT - SHEET
SIDA - SECURITY IDENTIFICATION DISPLAY AREA
SF - SQUARE FOOT
STA - STATION
SW - SINGLE WALL
SY - SQUARE YARD
TBR - TO BE REMOVED
TDG - TAXIWAY DESIGN GROUP
TEL - TELEPHONE
TEMP - TEMPORARY
THK - THICK
T/L - TAXILANE
T.O. - TOP OF
TOC - TOP OF CONCRETE
TOD - TOP OF DUCT
TOFA - TAXIWAY OBJECT FREE AREA
TSA - TAXIWAY SAFETY AREA OR
TRANSPORTATION SECURITY ADMINISTRATION
TW - TAXIWAY
TYP - TYPICAL
UD - UNDERDRAIN
UG - UNDERGROUND
VA - VOLT-AMPS
VERT - VERTICAL
VSR - VEHICLE SERVICE ROAD
W - WATER
W/ - WITH
W/O - WITHOUT
YI - YARD INLET
YL - YARD LIGHT

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FAYETTEVILLE REGIONAL AIRPORT

TAXIWAY F AND G REHABILITATION PACKAGE

FAYETTEVILLE, NC

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUED FOR
1	06/25/2026	ADDENDUM #02

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SHEET TITLE

INDEX OF DRAWINGS AND SUMMARY OF QUANTITIES

SHEET NUMBER

C001

BIDDING DOCUMENTS

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