

February 16, 2021

To: Plan Holders for Improvements to the
Kirksville Regional Airport
Kirksville, Missouri
MoDOT Project No. 20-0298A-1

Transmitted herewith is Addendum **No. 1** to the Issued for Bid Contract Documents, Specifications and Plans dated February 9, 2021 for Improvements to the Kirksville Regional Airport.

Schedule I – Runway 18/36 RehabilitationA
Schedule II – Taxiway B Rehabilitation Between Taxiway A and Apron
Schedule III – Remove and Construct Mid-Field Connector Taxiway B

- In addition to the in-person meeting, a conference call alternative is being offered for the pre-bid meeting. If choosing the conference call option, please use the following conference call number:
 - 1-937-240-2430
 - Phone Conference ID: **148 310 644#**

As a reminder, bids are due Tuesday, March 16, 2021 at 3:00 PM.

Sincerely,

Jviation, A Woolpert Company

Bryan Gregory, P.E.
Project Manager



**ADDENDUM NO. 1
TO
CONTRACT DOCUMENTS, SPECIFICATIONS AND PLANS
FOR IMPROVEMENTS TO THE
KIRKSVILLE REGIONAL AIRPORT
KIRKSVILLE, MISSOURI
MODOT PROJECT NO. 20-028A-1**

To All Bidders: You are requested to make all changes and/or additions contained in this addendum to the Bidding Documents. Failure to acknowledge this Addendum in Proposal shall result in rejection of bid. Bidders are informed that the above referenced Contract Documents, Specifications and Plans are modified as follows as of February 16, 2021:

1. CONTRACT DOCUMENTS/SPECIFICATIONS

Contract Documents.

Sections:

- Request for Bids/Invitation for Bids, first paragraph
- Section 1, page 1-1, first paragraph
- Section 2, page 2-1, item 5

Revision: Changed bid opening date to Tuesday, March 16, 2021.

Justification: Bid opening date was moved back.

Sections:

- Request for Bids/Invitation for Bids, first paragraph
- Section 1, page 1-1, third paragraph

Revision: Changed the bid site to: <http://bid.jviation.com>

Justification: Bid site was corrected throughout the document

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

Revision: Updated 102-4.1 and 102-5.1 to call out Temporary Erosion Control to be measured and paid by lump sum.

Justification: Clarifies how temporary erosion control will be paid.

Sections: CSPP

Revision: Revised Schedule I, Phase 3 to state that the southern portion of Runway 18/36 will be closed during construction of this phase.

Justification: Clarifies what portion of Runway 18/36 will be rehabilitated during Phase 3.

Sections: CSPP

Revision: Revised Schedule III, Phase 3 to clarify that the full taxiway connector from Runway 18/36 to Taxiway A will be constructed during this phase.

Justification: Clarifies that all of Taxiway B will be constructed during Phase 3.

Sections: CSPP

Revision: Changed the Project Manager to Kevin Scherr.

Justification: Clarifies the correct contact for Jviation during Construction.

Specifications.

Section: Item P-151 Clearing and Grubbing

Revision: Revised 151-3.1

“No separate measurement for payment shall be made for clearing and grubbing. Clearing and grubbing shall be considered necessary and incidental to the work of this Contract.”

Justification: Clarified no separate payment will be made for clearing and grubbing.

Section: Item P-151 Clearing and Grubbing

Revision: Revised 151-4.1

“No payment will be made separately or directly for clearing and grubbing. Clearing and grubbing shall be considered necessary and incidental to the work of this Contract.”

Justification: Clarified no separate payment will be made for clearing and grubbing.

Section: Item P-152 Excavation, Subgrade, and Embankment

Revision: Revised 152-2.14. Removed references to T-905.

Justification: T-905 specification is not included with this project.

Section: Item P-155 Lime-Treated Subgrade

Revision: Added Section 155-7.2 “Lime shall be paid by the number of tons of Hydrated Lime applied at the application rate specified in paragraph 155-3.1.

- a. Hydrated lime delivered to the project in dry form will be measured according to the actual tonnage either spread on the subgrade or batched on site into a slurry, whichever is applicable.
- b. Quicklime delivered to the project in dry form will be measured for payment on the basis of tons of equivalent hydrated lime using the following formula:

Equivalent Hydrated Lime (CA(OH)₂)=Total Quicklime (Ca))x1.32

- c. Lime delivered to the project in slurry form will be measure for payment in tons, dry weight of hydrated lime or equivalent hydrated lime in accordance with paragraph b above.”

Justification: Clarified how Hydrated Lime would be measured

Section: Item P-155 Lime-Treated Subgrade

Revision: Added Section 155-8.2 “Payment shall be made at the contract unit price per ton (kg). This price shall be full compensation for furnishing, delivery, and placing this material.”

Justification: Clarified how Lime would be paid for.

Section: Item P-209 Crushed Aggregate Base Course

Revision: Revised Gradation of Aggregate Base Table so No.200 sieve had a Design Range of 0-5.

Justification: Kirksville Regional Airport is susceptible to frost. The specification recommends lowering the 200 sieve.

Section: Item P-209 Crushed Aggregate Base Course

Revision: Revised 209-4.2 First Paragraph.

“Separation of geotextile shall be measured by the number of square yards of materials placed and accepted by the RPR as complying with the plans and specifications excluding seam overlaps and edge anchoring.”

Justification: Clarified how the geotextile fabric will be measured.

Section: Item P-209 Crushed Aggregate Base Course

Revision: Revised 209-5.2 First Paragraph.

“Payment shall be made at the contract unit price per square yard for separation geotextile. The price shall be full compensation for furnishing all labor, equipment, material, anchors and incidentals necessary.”

Justification: Clarified how the geotextile fabric will be paid for.

Section: Item P-620 Runway and Taxiway Marking

Revision: Revised specification to include requirements for Thermoplastic Airport Pavement Markings.

Justification: The hold position signs at Taxiway B are to be placed as Thermoplastic Markings.

Section: Item P-620 Runway and Taxiway Marking

Revision: Revised 620-5.3 Second Paragraph.

“Payment will be made under:

Item P-620a	Temporary Pavement Markings (White and Yellow) –per square foot (square meter)
Item P-620b	Permanent Pavement Markings (White and Yellow) –per square foot (square meter)
Item P-620c	Permanent Pavement Markings (Black) –per square foot (square meter)
Item P-620d	Pavement Marking Obliteration –per square foot (square meter)
Item P-620d	Thermoplastic Hold Position Signs –Each”

Justification: Clarified how each pavement marking would be paid for.

2. PLANS

G002 (2 of 62) – P-155b Description was changed to “Hydrated Lime”

Justification: To clarify that Lime is to utilized on the project, not Lime Kilm Dust

3. **QUESTIONS**

For the pre-bid, is it only on-site or due to current conditions would an alternative include call-in?

Answer: *There will be a conference call-in option. 937-240-2430 ID: 148 310 644#*

What is the best way to download the plan holders list?

Answer: *<http://bid.jviation.com>*

Where do I find the information on the OEM for the airfield guidance sign replacement panels and add-on modules?

Answer: *The existing signs are ADB signs, but the contractor should verify at the pre-bid meeting the OEM for each sign.*

**** END OF ADDENDUM NO. 1 ****

CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

Schedule I

Runway 18/36 Rehabilitation

Schedule II

Taxiway B Rehabilitation

Schedule III

Remove and Construct Mid-field Connector Taxiway B

MoDOT Project No. 20-028A-1

KIRKSVILLE
REGIONAL AIRPORT

Kirksville, Missouri

Sponsored By:

City of Kirksville

Federal Aviation Administration

MoDOT

JVIATION®

931 Wildwood Drive, Suite 101
Jefferson City, MO 65109

Main 573.636.3200
Fax 573.636.3201

Addendum No. 1
February 16, 2021

JVIATION.COM

REQUEST FOR BIDS/INVITATION FOR BIDS

**Kirksville Regional Airport
Kirksville, Missouri
State Block Grant Project No. 20-028A-1**

Sealed bids will be received until 3:00 p.m., Tuesday, March 16, 2021, and then publicly opened and read by the City of Kirksville at City Council Chambers, Kirksville City Hall, 201 S. Franklin Street, for furnishing all labor, materials and equipment and performing all work necessary to

Schedule I - Runway 18/36 Rehabilitation

Schedule II - Taxiway B Rehabilitation

Schedule III - Remove and Construct Mid-field Connector Taxiway B

Contract Documents. The complete set of Specifications and Contract Documents can be downloaded from Jviation, a Woolpert Company's bid site (<http://bid.jviation.com>), beginning on February 9, 2021. In order to submit a responsive bid as a Prime Contractor and to receive all necessary addendum(s) for this project, you must be on the Planholder's List. To view all planholder documents (contract documents, plans and addendums) you must fill out the online form located at (<https://jviation.com/bid-request>). By filling out and submitting this form, you agree to be publicly listed on the bid site with your contact information as a planholder for all projects requested. **It is the planholder's responsibility to review the site for addendums and changes before submitting their proposal.** For additional information, please contact us via email at bid.info@woolpert.com.

*Note that contractors will NOT be automatically added to new projects. You will need to re-submit the online form for access to new projects. Once granted access, additional projects will use your same login credentials. **Note:** Plan ahead when submitting the online request form and allow up to 2 business days for approval and access to projects.

Pre-Bid Conference. The pre-bid conference for this project will be held on Tuesday, February 23, 2021 at 2:00 p.m., at the Kirksville Regional Airport, Airport Conference Room, 27161 David Hall Trail, Kirksville, MO 63501. All bidders are required to examine the site to become familiar with all site conditions.

Bid Conditions. The bidder is required to provide all information as required within the Contract Documents. The bidder is required to bid on all items of every schedule or as otherwise detailed in the Instructions to Bidders.

Each proposal must be accompanied by a bid guaranty in the amount of five (5) percent of the total amount of the bid. The bid guaranty may be by certified check or bid bond made payable to City of Kirksville.

Bids may be held by City of Kirksville for a period not to exceed 90 calendar days from the date of the bid opening for the purpose of evaluating bids prior to award of contract.

The right is reserved, as City of Kirksville may require, to reject any and all bids and to waive any informality in the bids received.

Construction for this project is expected to take 110 Calendar Day(s).

In accordance with the Davis-Bacon Act, and the Missouri Prevailing Wage Law, the Contractor will be required to comply with the wage and labor requirements and to pay minimum wages in accordance with the schedule of wage rates established by the United States Department of Labor and the Missouri Division of Labor Standards, respectively. The highest rate between the two (Federal and State) for each job classification shall be considered the prevailing wage.

Equal Employment Opportunity and Affirmative Action Requirement. The proposed contract is under and subject to 41 CFR Part 60-4 and Executive Order 11246 of September 24, 1965, as amended, and to the equal opportunity clause and the Standard Federal Equal Employment Opportunity Construction Contract specifications including the goals and timetables for minority and female participation.

Title VI Solicitation Notice: The City of Kirksville, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

DBE Requirement.

Information Submitted as a matter of bidder responsiveness:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR §26.53.

As a condition of bid responsiveness, the Bidder or Offeror must submit the following information with its proposal on the forms provided herein:

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

Award of contract is also subject to the following Federal provisions:

- Affirmative Action to Ensure Equal Employment Opportunity
- Buy American Preference
- Civil Rights – Title VI Assurances
- Davis Bacon Act
- Disadvantaged Business Enterprise
- Government wide Debarment and Suspension
- Foreign Trade Restriction
- Lobbying Federal Employees
- Recovered Materials
- Other Federal Provisions included in Part A of the Special Provisions

BID DOCUMENTS & TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

SECTION 1

Notice to Bidders.....	1-1
------------------------	-----

SECTION 2

Instructions to Bidders.....	2-1
------------------------------	-----

SECTION 3

General Provisions (FAA).....	3-1
Section 10 – Definition of Terms.....	3-3
Section 20 – Proposal Requirements and Conditions.....	3-9
Section 30 – Award and Execution of Contract.....	3-13
Section 40 – Scope of Work.....	3-15
Section 50 – Control of Work.....	3-19
Section 60 – Control of Materials.....	3-25
Section 70 – Legal Regulations and Responsibility to Public.....	3-29
Section 80 – Execution and Progress	3-35
Section 90 – Measurement and Payment	3-41
General Construction Items (FAA)	
Item C-100 – Contractor Quality Control Program (CQCP).....	3-49
Item C-102 – Temporary Air and Water Pollution, Soil Erosion, and Siltation Control.....	3-57
Item C-105 – Mobilization	3-61
Item C-110 – Method of Estimating Percentage of Material within Specification Limit (PWL)	3-63

SECTION 4

Supplementary Provisions	4-1
Part A – Federal and State Provisions	4-1
Part B – DBE Administration.....	4-31
Part C – Local Provisions	4-37
Part D – Federal and State Wage Rates	4-45

SECTION 5

Technical Specifications	5-1
--------------------------------	-----

APPENDIX

Advisory Circulars	APP-A
Construction and Phasing Plan (CSPP)	APP-B
Geotechnical Report	APP-C

PROPOSAL/FORMS

Proposal Form.....	B-1
Performance Bond.....	B-23
Payment Bond	B-37
Contract Agreement	B-31

SECTION 1

NOTICE TO BIDDERS

Kirksville Regional Airport
Kirksville, Missouri
State Block Grant Project No. 20-028A-1

Sealed bids subject to the conditions and provisions presented herein will be received until 3:00 p.m., Tuesday, March 16, 2021, and then publicly opened and read at City Council Chambers, Kirksville City Hall, 201 S. Franklin Street, for furnishing all labor, materials, equipment and performing all work necessary to

Schedule I - Runway 18/36 Rehabilitation

Schedule II - Taxiway B Rehabilitation

Schedule III - Remove and Construct Mid-field Connector Taxiway B

Contract Documents. The complete set of Specifications and Contract Documents can be downloaded from Jviation, a Woolpert Company's bid site (<http://bid.jviation.com>), beginning on February 9, 2021. In order to submit a responsive bid as a Prime Contractor and to receive all necessary addendum(s) for this project, you must be on the Planholder's List. To view all planholder documents (contract documents, plans and addendums) you must fill out the online form located at (<https://jviation.com/bid-request>). By filling out and submitting this form, you agree to be publicly listed on the bid site with your contact information as a planholder for all projects requested. **It is the planholder's responsibility to review the site for addendums and changes before submitting their proposal.** For additional information, please contact us via email at bid.info@woolpert.com.

*Note that contractors will NOT be automatically added to new projects. You will need to re-submit the online form for access to new projects. Once granted access, additional projects will use your same login credentials. **Note:** Plan ahead when submitting the online request form and allow up to 2 business days for approval and access to projects.

Pre-Bid Conference. The pre-bid conference for this project will be held on Tuesday, February 23, 2021 at 2:00 p.m., at the Kirksville Regional Airport, Airport Conference Room, 27161 David Hall Trail, Kirksville, MO 63501. All bidders are required to examine the site to become familiar with all site conditions.

Contract Work Items. This project will involve the following work items and estimated quantities. Prospective bidders are hereby advised that the quantities indicated herein are approximate and are subject to change.

SUMMARY OF APPROXIMATE QUANTITIES

Item No.	Item Description	Unit	Sch I	Sch II	Sch III
			ESTIMATE	ESTIMATE	ESTIMATE
C-100a	Contractor Quality Control Program (CQCP)	LS	1	1	1
C-102a	Temporary Erosion Control	LS	1	1	1
C-105a	Mobilization	LS	1	1	1
P-101a	Full Depth Pavement Removal - Complete	SY	-	-	3,250
P-101b	Spall Repair (Complete)	SY	4,000	140	-
P-101c	Crack Repair (Complete)	LF	6,000	600	-
P-101d	Panel Removal and Replacement (Complete)	SY	4,280	620	-

Item No.	Item Description	Unit	Sch I	Sch II	Sch III
P-101e	Remove and Replace Joint Sealant (Complete)	LF	90,000	3,400	-
P-152a	Unclassified Excavation	CY	-	-	3,200
P155a	Lime-treated subgrade	SY	-	-	3,070
P-155b	Hydrated Lime	TON	-	-	180
P-209a	Crushed Aggregate Base Course (6-Inches)	CY	-	-	550
P-209b	Stabilization Fabric	SY	-	-	3,070
P-501a	Portland Cement Concrete Pavement	SY	-	-	3,070
P-620a	Temporary Pavement Marking	SF	55,000	-	1,000
P-620b	Permanent Pavement Markings	SF	85,500	210	1,000
P-620c	Black Pavement Markings	SF	28,000	500	1,850
P-620d	Pavement Marking Obliteration	SF	85,000	-	300
P-620e	Thermoplastic Hold Position Signs	EA	-	-	2
T-901a	Seeding with Hydromulch	AC	-	-	2
L-108a	Install #8 AWG, L-824C, 5000V, Wire	LF	-	-	4,930
L-108b	Install #6 AWG, Bare Copper Counterpoise Including Ground Rods and Terminations	LF	-	-	3,210
L-110a	Install 1-2" SCH. 40 PVC Duct, Direct Earth Buried	LF	-	-	2,950
L-110b	Install 1-2" SCH. 40 PVC Duct, Concrete Encased	LF	-	-	190
L-110c	Install 4-2" SCH. 40 PVC Duct, Concrete Encased	LF	-	-	70
L-115a	Remove L-867B Junction Box, Complete	EA	-	-	3
L-115b	Install L-867B Junction Box, Complete	EA	-	-	2
L-125a	Remove Taxiway Edge Light, Complete	EA	-	-	24
L-125b	Remove Runway In-Pavement Light, Complete	EA	-	-	1
L-125c	Install L-862 Runway Edge Light, Base Mounted, White/White Lens, Complete	EA			1
L-125d	Reinstall L-861T LED Taxiway Edge Light	EA	-	-	24
L-125e	Install L-861T LED Taxiway Edge Light	EA	-	-	17
L-125f	Remove L-858 Guidance Sign, Complete	EA	-	-	4
L-125g	Reinstall 1 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Four New Panels, Complete	EA	-	-	2

Item No.	Item Description	Unit	Sch I	Sch II	Sch III
L-125h	Reinstall 2 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Six New Panels, Complete	EA	-	-	1
L-125i	Reinstall 3 Module L-858 Guidance Sign on New Concrete Pad with Six New Panels, Complete	EA	-	-	1
L-125j	Extend Existing 1 Module L-858 Guidance Sign Base to 2 Module Base and Install 4 New Panels, Complete	EA	-	-	4
L-125k	Extend Existing 2 Module L-858 Guidance Sign Base to 3 Module Base and Install 6 New Panels, Complete	EA	-	-	1
L-125l	Remove Existing Panels from 2 Module L-858 Guidance Sign and Install 4 New Panels, Complete	EA			2
L-125m	Remove Existing Panels from 3 Module L-858 Guidance Sign and Install 6 New Panels, Complete	EA	-	-	3

Contract Time. The owner has established a contract perform time of 110 Calendar Day(s) from the date of the Notice-to-Proceed. All project work shall be substantially completed within the stated timeframe. This project is subject to liquidated damages as prescribed in the project manual.

Bid Security. No bid will be considered unless accompanied by a certified check or cashier's check on any bank or trust company insured by the Federal Deposit Insurance Corporation, payable to the Owner, for not less than five (5) percent of the total amount of the bid, or by a bid bond secured by an approved surety or sureties, payable to the City of Kirksville, for not less than five (5) percent of the total amount of the bid.

Bonding Requirements. The successful bidder will be required to furnish separate performance and payment bonds each in an amount equal to 100% of the contract price at the time of contract execution.

Award of Contract. The Owner intends to award a contract resulting from this solicitation to the lowest, responsive, responsible bidder, whose offer, conforming to the solicitation, will be most advantageous to, and in the best interest of, the Owner, cost or price and other factors considered.

- a. In addition to other factors, bid offers will be evaluated on the basis of advantages and disadvantages to the Owner that might result from offers received.
- b. The Owner reserves the right to reject any or all proposals and to waive informalities and/or irregularities in the bid offer. Bids may be held by the owner for a period not to exceed 90 calendar days from the date of the bid opening for the purpose of conducting the bid evaluation.
- c. Total bid will be evaluated and awarded as follows: It is the Owner's intent to award this bid based on the **TOTAL BASE BID FOR ALL ITEMS, split awards will not be made.**
- d. The Owner will determine which Schedules and/or Bid Alternates will be awarded based on the received bid prices and available funding. The project award will be based on the low bid sum of the Schedules and Bid Alternates awarded by the Owner. Not all Schedules and/or Bid Alternates may be awarded. A combination of Schedules and Bid Alternates may be

awarded, including only a single Schedule. The numbering of the Schedules or Bid Alternates does not necessarily indicate the order of award.

- e. The project award is contingent on the availability of funding.

Federal Provision. This project is subject to the following Federal provisions, statutes and regulations;

Equal Employment Opportunity - Executive Order 11246 and 41 CFR Part 60: The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth within the supplementary provisions. The successful Bidder shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin.

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity:

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

Timetables

Goals for minority participation for each trade: 4.00 %

Goals for female participation in each trade: 6.9%.

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

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

As used in this notice and in the contract resulting from this solicitation, the "covered area" is City of Kirksville, Adair, and state of Missouri.

Disadvantaged Business Enterprise – 49 CFR Part 26: The requirements of 49 CFR Part 26, Regulations of the U.S. Department of Transportation, apply to this contract. It is the policy of MoDOT and the **City of Kirksville** to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. All firms qualifying under this solicitation are encouraged to submit bids/proposals regardless of their business size or ownership. Awards of this contract will be conditioned upon satisfying the requirements of this section. These requirements apply to all bidders, including those who qualify as a DBE. The owner's award of this contract is condition upon the bidder satisfying the good faith effort requirements of 49 CFR §26.53. A DBE contract goal of **3.0** percent has been established for this contract. The non-DBE bidder shall subcontract **3.0** percent of the dollar value of the base bid(s), excluding any additive alternates, to disadvantaged business enterprises (DBE) or make good faith efforts to meet the DBE contract goal. The bidder and any subcontractor who qualifies as a DBE who subcontracts work to another non-DBE

firm must subtract the amount of the non-DBE contract from the total DBE work counted toward the goal, as defined in 49 CFR Part 26.55.

The apparent successful competitor will be required to submit the following information as a condition of bid responsiveness: (1) the names and addresses of DBE firms that will participate in the contract; (2) a description of the work that each DBE firm will perform; (3) the dollar amount of the participation of each DBE firm participating; (4) written statement from bidder that attests their commitment to use the DBE firm(s) listed under (1) above to meet the owner's project goal; and (5) if the contract goal is not met, evidence of good faith efforts undertaken by the bidder, as described in Appendix A to 49 CFR Part 26.

The apparent successful competitor must provide written confirmation of participation from each of the DBE firms listed in their commitment with the proposal documents as a condition of bid responsiveness.

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

In addition, the contractor will also be required to comply with the wage and labor requirements and pay minimum wages in accordance with the schedule of wage rates established by the Missouri Division of Labor Standards included in the Supplementary Provisions.

The highest rate between the two (Federal and State) for each job classification shall be considered the prevailing wage.

Debarment, Suspension, Ineligibility and Voluntary Exclusion – Title 2 CFR Part 180 (Subpart C) Title 2, CFR Part 1200: The bidder certifies, by submission of a proposal or acceptance of a contract, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

Foreign Trade Restriction – 49 CFR Part 30: By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror--

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

Buy American Certificate – Aviation Safety and Capacity Act of 1990: This contract is subject to the "Buy American Preferences" of the Aviation Safety and Capacity Act of 1990. Prospective Bidders are required to certify that steel and manufactured products have been produced in the United States and to clearly identify those items produced or manufactured outside of the United States.

Additional Provisions: Modification to the project documents may only be made by written addendum by the Owner or Owner's authorized Representative.

323 The proposal must be made on the forms provided within the bound project manual. Bidders must supply all
324 required information prior to the time of bid opening.
325
326 Additional Federal provisions can be found in Section 4 of this document.

SECTION 2
INSTRUCTIONS TO BIDDERS

This section contains excerpts of the bidding requirements from Section 20 of the General Provisions. The bidder's attention is directed to Section 20 for complete details.

1. THE EXECUTED PROPOSAL FORM MUST BE SUBMITTED WITH EACH PAGE FROM SECTION B-1 THROUGH B-21. EACH FORM MUST BE COMPLETELY FILLED OUT.

2. The apparent low bidder shall submit "evidence of competency" and "evidence of financial responsibility" to the owner with the bid proposal in accordance with Section 20-02 of the General Provisions. In addition, the resumes of all key personnel shall be provided with the bid proposal detailing experience on similar airfield construction projects.

3. Each bidder shall certify in the Proposal Form at the time of bid submittal that they acknowledge receipt of all issued addenda.

4. No bid will be considered unless accompanied by a certified check or cashier's check on any bank or trust company insured by the Federal Deposit Insurance Corporation, payable to the owner, for not less than five (5) percent of the amount of the bid, or by a bid bond secured by an approved surety or sureties (licensed to conduct surety business in the state of Missouri), payable to the owner, for not less than five (5) percent of the amount of the bid.

5. Proposals shall be sent to arrive at the time and date specified in Section 1, Notice to Bidders. Proposals received after the specified time and date will not receive consideration and will be returned unopened. Prior to submittal, the proposal shall be placed in a sealed opaque envelope and addressed to:

City Council Chambers, Kirksville City Hall, 201 S. Franklin Street

The upper left hand corner of the envelope should be marked as follows:

Sealed Bid Proposal

Bid of NAME OF BIDDER

For construction improvements at Kirksville Regional Airport

State Block Grant Project No.: 20-028A-1

To be opened at: 3:00 p.m., Tuesday, March 16, 2021

For a modification to a previously submitted proposal, insert "Modification to Proposal" in place of "Sealed Bid Proposal".

6. The Owner reserves the right to reject any or all bids, as determined to be in the best interest of the Owner. Causes for rejection of proposals include but are not limited to:

- Submittal of more than one proposal from the same partnership, firm or corporation;
- Failure by Bidder to submit the bid prior to the stated time and date for receipt of bids;
- Failure by Bidder to furnish satisfactory bid guarantee;
- Failure by Bidder to provide all information required of the bid forms;
- Failure by Bidder to comply with the requirements of bid instructions;
- Failure by Bidder to complete the applicable Buy American Certification;
- Failure by the Bidder to demonstrate good faith efforts in obtaining participation by certified DBE firms;
- Determination by the Owner that Bidder is not qualified to accomplish the project work;
- Determination by the Owner that the Bidder has placed conditions on or qualified their proposal;

- Discovery of any alteration, interlineations or erasure of any project requirement by the Bidder;
- Inclusion of the Bidder as an Excluded Party in the System for Award Management;
- Evidence of collusion among bidders.

7. Construction and building materials sold to the contractors and subcontractors for use on public works owned by City of Kirksville are exempt from State Sales and Use Taxes. However, such materials will be subject to any Sales and Use Taxes imposed by local cities and counties. This change in the State Tax Law has no effect of Sales and Use Taxes imposed by other local taxing authorities. Contractor shall provide proof of exemption prior to commencing work.

SECTION 3**PART 1 – GENERAL CONTRACT PROVISIONS**

SECTION 10	DEFINITION OF TERMS
SECTION 20	PROPOSAL REQUIREMENTS AND CONDITIONS
SECTION 30	AWARD AND EXECUTION OF CONTRACT
SECTION 40	SCOPE OF WORK
SECTION 50	CONTROL OF WORK
SECTION 60	CONTROL OF MATERIALS
SECTION 70	LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC
SECTION 80	PROSECUTION AND PROGRESS
SECTION 90	MEASUREMENT OF PAYMENT

PART 2 - GENERAL CONSTRUCTION ITEMS

ITEM C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)
ITEM C-102	TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILT CONTROL
ITEM C-105	MOBILIZATION
ITEM C-110	METHOD OF ESTIMATING PERCENTAGE OF MATERIAL WITHIN SPECIFICATION LIMITS (PWL)

Intentionally Left Blank

SECTION 10 DEFINITION OF TERMS

Whenever 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 interpreted as follows:

Paragraph Number	Term	Definition
10-01	AASHTO	The American Association of State Highway and Transportation Officials.
10-02	Access Road	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	Advertisement	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	Airport	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
10-05	Airport Improvement Program (AIP)	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	Air Operations Area (AOA)	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	Apron	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	ASTM International (ASTM)	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	Award	The Owner's notice to the successful bidder of the acceptance of the submitted bid.
10-10	Bidder	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	Building Area	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	Calendar Day	Every day shown on the calendar.
10-13	Certificate of Analysis (COA)	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	Certificate of Compliance (COC)	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.

Paragraph Number	Term	Definition
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	<p>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.</p> <p>The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.</p>
10-17	Contract Item (Pay Item)	A specific unit of work for which a price is provided in the contract.
10-18	Contract Time	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	Contractor	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	Contractors Quality Control (QC) Facilities	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	Contractor Quality Control Program (CQCP)	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	Control Strip	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	Construction Safety and Phasing Plan (CSPP)	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	Drainage System	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	Engineer	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.

Paragraph Number	Term	Definition
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	<p>a. Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis.</p> <p>b. Owner Force Account - Work performed for the project by the Owner's employees.</p>
10-31	Intention of Terms	<p>Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner.</p> <p>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.</p>
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.

Paragraph Number	Term	Definition
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 City of Kirksville.
10-38	Passenger Facility Charge (PFC)	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	Pavement Structure	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	Payment bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.
10-41	Performance bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	Plans	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	Project	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	Proposal	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	Proposal guaranty	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	Quality Assurance (QA)	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	Quality Control (QC)	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	Quality Assurance (QA) Inspector	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

10-49	Quality Assurance (QA) Laboratory	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	Resident Project Representative (RPR)	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	Runway	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	Safety Plan Compliance Document (SPCD)	Details how the Contractor will comply with the CSPP.
10-54	Specifications	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	Sponsor	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	Structures	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	Subgrade	The soil that forms the pavement foundation.
10-58	Superintendent	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	Supplemental Agreement	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%; (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	Surety	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	Taxilane	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.

10-62	Taxiway	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	Taxiway/Taxilane Safety Area (TSA)	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	Work	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	Working day.	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	Owner Defined terms	None.

END OF SECTION 10

SECTION 20

PROPOSAL REQUIREMENTS AND CONDITIONS

20-01 ADVERTISEMENT (Notice to Bidders). This project has been advertised on the following dates:

MoDOT's LPA Website

(http://www.modot.org/business/contractor_resources/bid_opening_info/advertisement.htm):

February 9, 2021 to March 8, 2021

City of Kirksville website: February 9, 2021 to March 8, 2021

Kirksville Daily Express: February 13, 2021 and February 17, 2021

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

Evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work.

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

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

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

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

A prebid conference is required on this project to discuss as a minimum, the following items: material requirements; submittals; Quality Control/Quality Assurance requirements; the construction safety and phasing plan including airport access and staging areas; and unique airfield paving construction requirements. The pre-bid conference for this project will be held on Tuesday, February 23, 2021 at 2:00 p.m., at the Kirksville Regional Airport, Airport Conference Room, 27161 David Hall Trail, Kirksville, MO 63501.

20-04 ISSUANCE OF PROPOSAL FORMS. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder should such bidder be in default for any of the following reasons:

- a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.

- b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective bidder.
- c. Documented record of Contractor default under previous contracts with the Owner.
- d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-05 INTERPRETATION OF ESTIMATED PROPOSAL QUANTITIES. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as hereinafter provided in the Section 40, paragraph 40-02, *ALTERATION OF WORK AND QUANTITIES*, without in any way invalidating the unit bid prices.

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

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

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

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

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

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

20-09 IRREGULAR PROPOSALS. Proposals shall be considered irregular for the following reasons:

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

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

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

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

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

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

20-14 DISQUALIFICATION OF BIDDERS. A bidder shall be considered disqualified for any of the following reasons:

- a. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.

- 597 **b.** Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as
598 bidders for any future work of the Owner until any such participating bidder has been reinstated by
599 the Owner as a qualified bidder.
600
- 601 **c.** If the bidder is considered to be in “default” for any reason specified in the paragraph 20-04,
602 *ISSUANCE OF PROPOSAL FORMS*, of this section.
603

604 **20-15 Discrepancies and Omissions.** A Bidder who discovers discrepancies or omissions with the project
605 bid documents shall immediately notify the Owner’s Engineer of the matter. A bidder that has doubt as to the
606 true meaning of a project requirement may submit to the Owner’s Engineer a written request for interpretation
607 no later than five (5) days prior to bid opening.
608

609 Any interpretation of the project bid documents by the Owner’s Engineer will be by written addendum issued
610 by the Owner. The Owner will not consider any instructions, clarifications or interpretations of the bidding
611 documents in any manner other than written addendum.
612

613
614 **END OF SECTION 20**
615

SECTION 30 AWARD AND EXECUTION OF CONTRACT

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

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

- a. If the proposal is irregular as specified in the Section 20, paragraph 20-09, *IRREGULAR PROPOSALS*.
- b. If the bidder is disqualified for any of the reasons specified in the section 20, paragraph 20-14, *DISQUALIFICATION OF BIDDERS*.

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

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

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

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

30-04 RETURN OF PROPOSAL GUARANTY. All proposal guaranties, except those of the two lowest bidders, will be returned immediately after the Owner has made a comparison of bids as specified in the paragraph 30-01, *CONSIDERATION OF PROPOSALS*. Proposal guaranties of the two lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's proposal guaranty will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in the paragraph 30-05, *REQUIREMENTS OF CONTRACT BONDS*.

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

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

30-07 APPROVAL OF CONTRACT. Upon receipt of the contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance

with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract.

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

END OF SECTION 30

SECTION 40

SCOPE OF WORK

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

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

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

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

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

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

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

40-04 EXTRA WORK. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *PAYMENT FOR EXTRA WORK*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *SUPPLEMENTAL AGREEMENT*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

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

40-05 MAINTENANCE OF TRAFFIC. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in the 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 the 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 such 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 CLEANING UP. 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 such property owner.

END OF SECTION 40

836

Intentionally Left Blank

837

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 his or her 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 FAA/MoDOT, to use sound engineering judgment in his or her determinations as to acceptance of work that is not in strict conformity, but will provide a finished product equal to or better than that intended 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. See Section 4 for the Project Special Provisions.

50-05 COOPERATION OF CONTRACTOR. The Contractor will be supplied with five hard copies or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hard copy 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 save 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 his or her 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.

50-06 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): Electronic format that includes Point Number, Northing, Easting, Elevation, and Description (PNEZD, comma delimited 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 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

Intentionally Left Blank

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

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

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

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

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

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

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

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

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

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

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

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

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

60-05 ENGINEER/RESIDENT PROJECT REPRESENTATIVE (RPR) FIELD OFFICE. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity. This facility shall be an approved weatherproof building meeting the current State Highway Specifications for a Class II Field Office. A land line telephone and answering machine shall be provided. The Contractor shall be responsible for payment of the basic monthly charge, long distance and local calls. The Contractor shall furnish a FAX machine, network capable color photocopier/printer (capabilities for up to 11" x 17" media for copying, scanning directly to email, and printing via Windows XP 32-bit, Windows 7 64-bit and Windows 10 64-bit computers), office chairs, water, sanitary facilities, heat, air conditioning, and electricity. The Contractor shall provide and be responsible for payment of Internet access for computers and equipment at the jobsite office location, with consistent minimum performance of 15 Mbps download, 5 Mbps upload and ping latency under 100ms, as tested from computers and equipment behind the

firewall to <https://www.speedtest.net/>. Internet protection shall be provided with a current production, supported, and updated firewall configured with all outbound ports available. The Contractor shall provide and maintain all wired and wireless connectivity to the Internet and between devices. The Contractor and the Contractor's superintendent shall provide all reasonable facilities to enable the Engineer to inspect the workmanship and materials used in the work.

Failure by the Contractor to provide these amenities to the Engineer's onsite personnel will result in the delay of payment to the Contractor.

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

Intentionally Left Blank

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:

Owner (Utility or Other Facility)	Location (See Plan Sheet No.)	Person to Contact (Name, Title, Address and Phone)
Kirksville Regional Airport	Various	Glenn Balliew (660) 665-5020
FAA	Various	Mr. Ronald Dille (660) 665-9477
Ameren		(800) 552-7583
Other Utilities	Various	Missouri One Call 1-800-DIG-RITE or 1-800-344-7483

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 aid 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) G050-G058 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 own 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.

Phase or Description	Required Date or Sequence of Owner's Beneficial Occupancy	Work Shown on Plan Sheet
Refer to the Phasing Plans of the Construction Drawings.		

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.

Utility Service or Facility	Person to Contact (Name, Title, Address, & Phone)	Owner's Emergency Contact (Phone)
Missouri One Call	1-800-DIG-RITE or 1-800-344-7483	1-800-DIG-RITE or 1-800-344-7483
FAA		(660) 665-9477
Ameren (Electric)		(800-552-7583
Kirksville Regional Airport	Mr. Glenn Balliew 27161 David Hall Trail Kirksville, MO 63501	(660) 665-5020

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 surety.

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 his or her surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill his or her 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 his or her operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the Engineer. The Engineer will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate

contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *EXTRA WORK*, and Section 90, paragraph 90-05, *PAYMENT FOR EXTRA WORK*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with the Section 80, paragraph 80-07, *DETERMINATION AND EXTENSION OF CONTRACT TIME*.

70-21 INSURANCE REQUIREMENTS.

The Contractor shall pay for and maintain during the life of this contract adequate Workmen's Compensation, Public Liability and Property Damage Insurance. The Contractor is charged with the responsibility for adequate and proper coverage for all his subcontract operations. Contractor shall furnish to the Sponsor satisfactory proof of carriage of the insurance required. Public Liability Insurance shall be in the amount of not less than \$1,000,000.00 for injuries, including accidental death, to any one person, nor less than \$1,000,000.00 on account of any one accident. Property Damage Insurance shall be carried in an amount not less than \$1,000,000.00. Such Liability Insurance shall include completed operation coverage.

END OF SECTION 70

SECTION 80 EXECUTION AND PROGRESS

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

The Contractor shall perform, with his organization, an amount of work equal to at least 50 percent of the total contract cost.

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

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

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

80-02 NOTICE TO PROCEED. The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within **10** days of the NTP date. The Contractor shall notify the RPR at least **24** in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

80-03 EXECUTION AND PROGRESS. Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least 10 days prior to the start of work. The Contractor's progress schedule, once accepted by the RPR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The RPR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR at least 24 hours in advance of resuming operations.

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

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall show

all work items identified in the project proposal for each work area and shall include the project start date and end date.

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

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

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

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) and as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently as follows:

AOA	Time Periods for Closure	Type of Communications Required	Control Authority
Refer to the Safety Plan of the Construction Drawings			Airport Supervisor

Contractor shall be required to conform to safety standards contained in AC 150/5370-2G, Operational Safety on Airports During Construction (see Special Provisions).

80-04.1 OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION. All Contractors' operations shall be conducted in accordance with the approved project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a SPCD that details how it proposes to comply with the requirements presented within the CSPP.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures.

The Contractor is responsible to the Owner for the conduct of all subcontractors it employs on the project. The Contractor shall assure that all subcontractors are made aware of the requirements of the CSPP and that they implement and maintain all necessary measures.

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

80-05 CHARACTER OF WORKERS, METHODS, AND EQUIPMENT. The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

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

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

Should the Contractor fail to remove such person or persons, or fail to furnish suitable and sufficient personnel for the proper execution of the work, the RPR may suspend the work by written notice until compliance with such orders.

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall not cause injury to previously completed work, adjacent property, or existing airport facilities due to its use.

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

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

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

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

ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

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

80-07 DETERMINATION AND EXTENSION OF CONTRACT TIME. The number of calendar days shall be stated in the proposal and contract and shall be known as the Contract Time.

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

80-07.1 CONTRACT TIME BASED ON CALENDAR DAYS. Contract Time based on calendar days shall consist of the number of calendar days stated in the contract counting from the effective date of the Notice to Proceed and including all Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

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

80-08 FAILURE TO COMPLETE ON TIME. For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time (including all extensions and adjustments as provided in the paragraph 80-07, *DETERMINATION AND EXTENSION OF CONTRACT TIME*, the sum specified in the contract and proposal as liquidated damages will be deducted from any money due or to become due the Contractor or his or her surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract.

Phase	Liquidated Damages Cost	Allowed Construction Time
Phase 1	\$2,500/Calendar Day(s)	15 Calendar Days
Phase 2	\$750/Calendar Day(s)	60 Calendar Days
Phase 3	\$750/Calendar Day(s)	20 Calendar Days
Phase 4	\$750/Calendar Day(s)	15 Calendar Days

The maximum construction time allowed for Schedules **I, II and III** will be the sum of the time allowed for individual schedules but not more than **110** days. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the Owner of any of its rights under the contract.

80-09 DEFAULT AND TERMINATION OF CONTRACT. The Contractor shall be considered in default of their contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons if the Contractor:

- a. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or

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

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

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

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

80-10 TERMINATION FOR NATIONAL EMERGENCIES. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the execution of war or in the interest of national defense.

When the contract, or any portion thereof, is terminated before completion of all items of work in the contract, payment will be made for the actual number of units or items of work completed at the contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

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

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

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

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

END OF SECTION 80

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 kg) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale

Term	Description
	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	<p>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.</p> <p>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.</p> <p>In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%.</p> <p>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.</p> <p>Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them.</p> <p>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.</p> <p>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</p>

Term	Description
	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 <i>Payment for Extra Work</i> .
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 the 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 the 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 unbalanced allocation of overhead and profit among the contract items, or from any other cause.

90-04 PAYMENT FOR OMITTED ITEMS. As specified in the 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 the 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, five (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.

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 so stored or stockpiled.
- e. The Contractor has furnished the Owner evidence that the material so 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 his or her 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 the 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 the 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 the Section 50, paragraph 50- 16, *CLAIMS FOR ADJUSTMENTS AND DISPUTES*, or under the provisions of this subsection, 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.

- b. 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.**
- 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.

- 1998 h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

1999
2000 **90-11 CONTRACTOR FINAL PROJECT DOCUMENTATION.** Approval of final payment to the
2001 Contractor is contingent upon completion and submittal of the items listed below. The final payment will not
2002 be approved until the RPR approves the Contractor's final submittal. The Contractor shall:

- 2003
2004 a. Provide two (2) copies of all manufacturer's warranties specified for materials, equipment, and
2005 installations.
- 2006
2007 b. Provide weekly payroll records (not previously received) from the general Contractor and all
2008 subcontractors.
- 2009
2010 c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *FINAL CLEANUP*.
- 2011
2012 d. Complete all punch list items identified during the Final Inspection.
- 2013
2014 e. Provide complete release of all claims for labor and material arising out of the Contract.
- 2015
2016 f. Provide a certification statement signed by the subcontractors, indicating actual amounts paid to the
2017 Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the
2018 project. A sample certification letter is available on the MoDOT Aviation website.
- 2019
2020 g. When applicable per state requirements, return copies of sales tax completion forms.
- 2021
2022 h. Provide manufacturer's certifications for all items incorporated in the work.
- 2023
2024 i. Provide all required record drawings, as-built drawings or as-constructed drawings.
- 2025
2026 j. Provide Project Operation and Maintenance (O&M) Manual.
- 2027
2028 k. Provide security for Construction Warranty.
- 2029
2030 l. Provide equipment commissioning documentation submitted, if required.
- 2031
2032 m. After the final inspection has been completed, a Notice of Contractor's Final Settlement will
2033 be issued for publication in accordance with applicable state, local, and federal requirements.
- 2034
2035 n. Contractor is required to submit on company letterhead that all wages, material purchases, and
2036 subcontractors have been paid in full.
- 2037
2038 o. Provide an Affidavit of Compliance (PW-4) from the general Contractor and all subcontractors that
2039 affirms under oath that the party has fully complied with Missouri Prevailing Wage Law.
- 2040
2041 p. List of all subcontractors used on the project with final dollar value of subcontracts and DBE
2042 subcontractors identified.
- 2043
2044 q. All test results in format required by the FAA. All tests results must be approved and accepted by the
2045 FAA before the RPR is authorized to release any retainage amounts.
- 2046

2047 Final payment will not be authorized until these items have been completed.”

2048
2049
2050 **END OF SECTION 90**

Intentionally Left Blank

GENERAL CONSTRUCTION ITEMS

ITEM C-100 CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)

100-01 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.

100-02 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 ten 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 items:

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.

100-03 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 paragraph 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

- a. Program Administrator.** The Contractor Quality Control Program Administrator (CQCPA) must be a full-time on-site employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving 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 highway and/or airport paving experience.

- (4) An individual with four (4) years of highway and/or airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

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 shall be provided. These personnel shall be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II 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 CQPA 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 subsection 100-06.
- (2) Performance of all QC tests as required by the technical specifications and subsection 100-07.
- (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.

100-04 PROJECT PROGRESS SCHEDULE. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *EXECUTION AND PROGRESS*.

100-05 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

100-06 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 100-09.

Inspections shall be performed daily as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. These 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 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 functions will be accomplished and used.

100-07 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

100-08 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 subsection 100-09.

100-09 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

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 sets of rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and 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 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 noncompliance, 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-100a 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

Intentionally Left Blank

Item C-102**TEMPORARY AIR AND WATER POLLUTION,
SOIL EROSION, AND SILTATION CONTROL**

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

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

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

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

MATERIALS

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

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

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

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

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

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

CONSTRUCTION REQUIREMENTS

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

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

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

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

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

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

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

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

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

METHOD OF MEASUREMENT

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

- a. Temporary erosion control will be measured by the lump sum.

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

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102a Temporary Erosion Control - per lump sum

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.

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	<i>Hazardous Wildlife Attractants on or Near Airports</i>
AC 150/5370-2	<i>Operational Safety on Airports During Construction</i>

ASTM International (ASTM)

ASTM D6461	<i>Standard Specification for Silt Fence Materials</i>
------------	--

United States Department of Agriculture (USDA)

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

END OF ITEM C-102

2553
2554

Intentionally Left Blank

ITEM C-105 MOBILIZATION

105-1 DESCRIPTION. This item shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, facilities, 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 State Wage Rates from the Project Manual and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 ENGINEER/RPR FIELD OFFICE. The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.

METHOD OF MEASUREMENT

105-5 METHOD OF MEASUREMENT. Partial payments for mobilization will be made once each month as the work progresses. Provided all requirements of applicable General and Special Provisions have been accomplished to the satisfaction of the Engineer, partial payments will be made as follows:

- a. When 5% of the original contract amount is earned, 20% of the amount bid for this item will be paid, not to exceed 2% of the original contract amount.
- b. When 20% of the original contract amount is earned, 50% of the amount bid for this item, less all previous payments, will be paid, not to exceed 5% of the original contract amount.
- c. When 35% of the original contract amount is earned, 60% of the amount bid for this item, less all previous payments, will be paid, not to exceed 6% of the original contract amount.
- d. When 75% of the original contract amount is earned, the amount bid for this item, less all previous payments, will be paid, not to exceed 10% of the original contract amount.
- e. When 90% of the original contract amount is earned, the amount in excess of 10% of the original contract amount, less all previous payments, will be paid.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105a Mobilization

REFERENCES

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

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

END OF ITEM C-105

ITEM C-110

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

110-01 GENERAL. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined 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 (\bar{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.

110-02 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 subplot 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 (\bar{X}) for all subplot values within the lot by using the following formula:

$$\bar{X} = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

Where: \bar{X} = Sample average of all subplot values within a lot

x_1, x_2, \dots, x_n = Individual subplot values

n = Number of subplot test values

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

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

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

d_1, d_2, \dots, d_n = Deviations of the individual subplot test values x_1, x_2, \dots from the average value \bar{X} that is: $d_1 = (x_1 - \bar{X})$, $d_2 = (x_2 - \bar{X})$... $d_n = (x_n - \bar{X})$

n = Number of sublots test values

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

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

Where: L = specification lower tolerance limit

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

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

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

and

$$Q_U = (U - X) / S_n$$

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

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

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

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

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

$$A-1 = 96.60$$

$$A-2 = 97.55$$

$$A-3 = 99.30$$

$$A-4 = 98.35$$

$$n = 4$$

2. Calculate average density for the lot.

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

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

$$X = 97.95\% \text{ density}$$

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.

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

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

$$X = 3.57\%$$

3. Calculate the standard deviation S_n for the lot.

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

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

$$S_n = 1.12$$

- 2758 4. Calculate the Lower Quality Index Q_L for the lot. ($L = 2.0$)

2759 $Q_L = (X - L) / S_n$

2760 $Q_L = (3.57 - 2.00) / 1.12$

2761 $Q_L = 1.3992$

- 2762
- 2763 5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and $n = 4$.

2764 $P_L = 97$

- 2765
- 2766 6. Calculate the Upper Quality Index Q_U for the lot. ($U = 5.0$)

2767 $Q_U = (U - X) / S_n$

2768 $Q_U = (5.00 - 3.57) / 1.12$

2769 $Q_U = 1.2702$

- 2770
- 2771 7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and $n = 4$.

2772 $P_U = 93$

- 2773
- 2774 8. Calculate Air Voids PWL

2775 $PWL = (P_L + P_U) - 100$

2776 $PWL = (97 + 93) - 100 = 90$

2777

2778

2779 **EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)**

2780

2781 **Project:** Example Project

2782

2783 **Test Item:** Item P-401, Lot A.

2784

2785 **A. Outlier Determination for Mat Density.**

- 2786
- 2787 1. Density of four random cores taken from Lot A arranged in descending order.

2788 $A-3 = 99.30$

2789 $A-4 = 98.35$

2790 $A-2 = 97.55$

2791 $A-1 = 96.60$

- 2792
- 2793 2. From ASTM E178, Table 1, for $n=4$ an upper 5% significance level, the critical value for test criterion
- 2794 $= 1.463$.

- 2795
- 2796 3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

- 2797
- 2798 a. For measurements greater than the average:

2799 If (measurement - average)/(standard deviation) is less than test criterion, then the

2800 measurement is not considered an outlier

2801 For A-3, check if $(99.30 - 97.95) / 1.15$ is greater than 1.463.

2802 Since 1.174 is less than 1.463, the value is not an outlier.

- 2803
- 2804 b. For measurements less than the average:

2805 If (average - measurement)/(standard deviation) is less than test criterion, then the

2806 measurement is not considered an outlier.

2807 For A-1, check if $(97.95 - 96.60) / 1.15$ is greater than 1.463.

2808 Since 1.435 is less than 1.463, the value is not an outlier.

2809

2810 **Note:** In this example, a measurement would be considered an outlier if the density were:
2811 Greater than $(97.95 + 1.463 \times 1.15) = 99.63\%$
2812 OR
2813 less than $(97.95 - 1.463 \times 1.15) = 96.27\%$.
2814
2815
2816

2817
2818
2819
2820
2821
2822
2823
2824
2825
2826
2827
2828
2829
2830
2831
2832
2833
2834
2835
2836
2837
2838
2839
2840
2841
2842
2843

Intentionally Left Blank

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

Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

2849

Percent Within Limits (P _L and P _U)	Negative Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

REFERENCES

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

ASTM International (ASTM)

ASTM E178

Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

2850

2851

2852

2853

2854

2855

2856

2857

2858

2859

2860

SECTION 4
SUPPLEMENTARY PROVISIONS

PART A
FEDERAL AND STATE PROVISIONS

1. CIVIL RIGHTS ACT OF 1964, TITLE VI ASSURANCES (Reference: 49 USC § 47123, FAA Order 1400.11)
2. CIVIL RIGHTS – GENERAL (Reference: 49 USC § 47123)
3. ACCESS TO RECORDS AND REPORTS (Reference: 2 CFR § 200.333, 2 CFR § 200.336, FAA Order 5100.38)
4. DISADVANTAGED BUSINESS ENTERPRISE (Reference: 49 CFR Part 26)
5. ENERGY CONSERVATION REQUIREMENTS (Reference: 2 CFR § 200 Appendix II(H))
6. BREACH OF CONTRACT TERMS (Reference: 2 CFR § 200 Appendix II(A))
7. VETERAN’S PREFERENCE (Reference: 49 USC § 47112(c))
8. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION CONSTRUCTION SAFETY TRAINING
9. DAVIS-BACON REQUIREMENTS (Reference: 2 CFR § 200 Appendix II(D), 29 CFR Part 5)
10. EQUAL OPPORTUNITY CLAUSE AND SPECIFICATIONS (Reference: 2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, CFR § 60-4.3, Executive Order 11246)
11. PROHIBITION OF SEGREGATED FACILITIES (Reference: 41 CFR § 60)
12. AFFIRMATIVE ACTION REQUIREMENT (Reference: 41 CFR Part 60-4, Executive Order 11246)
13. TERMINATION OF CONTRACT (Reference: 2 CFR § 200 Appendix II(B), FAA Advisory Circular 150/5370-10, Section 80-09)
14. CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS (Reference: 2 CFR § 200 Appendix II(E))
15. CLEAN AIR AND WATER POLLUTION CONTROL (Reference: 2 CFR § 200 Appendix II(G))
16. BUY AMERICAN PREFERENCE (Reference: 49 USC § 50101)
17. COPELAND “ANTI-KICKBACK” ACT (Reference: 2 CFR § 200 Appendix II(D), 29 CFR Parts 3 & 5)
18. FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE) (Reference: 29 USC § 201, et seq.)
19. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (Reference 20 CFR Part 1910)
20. DISTRACTED DRIVING (Executive Order 13513, DOT Order 3902.10)

- 2914 21. PROCUREMENT OF RECOVERED MATERIALS (Reference 2 CFR § 200.322, 40 CFR Part 247)
2915
2916 22. RIGHT TO INVENTIONS (Reference: 2 CFR § 200 Appendix II(F), 37 CFR § 401)
2917
2918 23. SEISMIC SAFETY (49 CFR Part 41)
2919
2920 24. CERTIFICATION OF BIDDER REGARDING TAX DELINQUENCY AND FELONY
2921 CONVICTIONS (Sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations
2922 Act, 2014, DOT Order 4200.6)
2923
2924

2925 1. **CIVIL RIGHTS ACT OF 1964, TITLE VI ASSURANCES**

2926
2927 During the performance of this contract, the contractor, for itself, its assignees and successors in interest
2928 (hereinafter referred to as the "contractor") agrees as follows:
2929

2930 **1.1(a) Compliance with Regulations.** The contractor (hereinafter includes consultants) will comply
2931 with the **Title VI List of Pertinent Nondiscrimination Acts and Authorities**, as they may be
2932 amended from time to time, which are herein incorporated by reference and made a part of this
2933 contract.
2934

2935 **1.1(b) Non-discrimination.** The contractor, with regard to the work performed by it during the
2936 contract, will not discriminate on the grounds of race, color, or national origin in the selection
2937 and retention of subcontractors, including procurements of materials and leases of equipment.
2938 The contractor will not participate directly or indirectly in the 7discrimination prohibited by the
2939 Acts and the Regulations, including employment practices when the contract covers any activity,
2940 project, or program set forth in Appendix B of 49 CFR part 21.
2941

2942 **1.1(c) Solicitations for Subcontracts, Including Procurements of Materials and Equipment.** In
2943 all solicitations, either by competitive bidding, or negotiation made by the contractor for work to
2944 be performed under a subcontract, including procurements of materials, or leases of equipment,
2945 each potential subcontractor or supplier will be notified by the contractor of the contractor's
2946 obligations under this contract and the Acts and the Regulations relative to Non-discrimination
2947 on the grounds of race, color, or national origin.
2948

2949 **1.1(d) Information and Reports.** The contractor will provide all information and reports required by
2950 the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its
2951 books, records, accounts, other sources of information, and its facilities as may be determined by
2952 the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with
2953 such Nondiscrimination Acts and Authorities and instructions. Where any information required
2954 of a contractor is in the exclusive possession of another who fails or refuses to furnish the
2955 information, the contractor will so certify to the sponsor or the Federal Aviation Administration,
2956 as appropriate, and will set forth what efforts it has made to obtain the information.
2957

2958 **1.1(e) Sanctions for Noncompliance.** In the event of a contractor's noncompliance with the Non-
2959 discrimination provisions of this contract, the sponsor will impose such contract sanctions as it
2960 or the Federal Aviation Administration may determine to be appropriate, including, but not
2961 limited:
2962

2963 a. Withholding of payments to the contractor under the contract until the contractor complies,
2964 and/or
2965

2966 b. Cancellation, termination, or suspension of the contract, in whole or in part.
2967

2968 **1.1(f) Incorporation of Provisions.** The contractor will include the provisions of paragraphs 1.1(a)
2969 through 1.1(f) in every subcontract, including procurements of materials and leases of equipment,
2970 unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor
2971 will take action with respect to any subcontract or procurement as the sponsor or the Federal
2972 Aviation Administration may direct as a means of enforcing such provisions including sanctions
2973 for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with
2974 litigation by a subcontractor, or supplier because of such direction, the contractor may request
2975 the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the
2976 contractor may request the United States to enter into the litigation to protect the interests of the
2977 United States.
2978

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

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

References: 49 USC § 47123, FAA Order 1400.11

2. GENERAL CIVIL RIGHTS PROVISIONS

The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

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

References: 49 USC § 47123

3. ACCESS TO RECORDS AND REPORTS

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

References: 2 CFR § 200.333, 2 CFR § 200.336, FAA Order 5100.38

4. DISADVANTAGED BUSINESS ENTERPRISES

Where used in this provision, "Department of Transportation" or "DOT" refers to the United States Department of Transportation. "MoDOT" refers to the Missouri Department of Transportation and the Missouri Highways and Transportation Commission.

Policy. It is the policy of the Department of Transportation that disadvantaged business enterprises as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal funds under this agreement. Consequently, the DBE requirements of 49 CFR Part 26, apply to this agreement.

Contract Assurance. MoDOT and the Sponsor will ensure that the following clause is placed in every USDOT assisted contract and subcontract.

"The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate."

(This assurance shall be included in each subcontract the prime contractor signs with a subcontractor.)

Federal Financial Assistance Agreement Assurances. MoDOT and the Sponsor agree to and incorporate the following assurance into the day to day operations and the administration of all USDOT assisted contracts; where “recipient” mean MoDOT and any MoDOT grantee receiving USDOT assistance:

“MoDOT or the Sponsor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any USDOT assisted contract or in the administration of its DBE Program or the requirements of 49 CFR Part 26. The recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of USDOT assisted contracts. The recipient’s DBE Program, as required by 49 CFR Part 26 and as approved by USDOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq.).”

MoDOT and the Sponsor ensure that all recipients of USDOT assisted contracts, funds, or grants incorporate, agree to and comply with the assurance statement.

Prompt Payment. MoDOT and the Sponsor require all contractors to pay all subcontractors and suppliers under this prime contract for satisfactory performance of its contract in compliance with the prompt payment statute, Mo. Revised Statutes, Chapter 34, Section 34.057 (included below). MoDOT and the Sponsor also requires the prompt, as defined in Section 34.057, return of all retainage held on all subcontractors after the subcontractor’s work is satisfactorily completed, as MoDOT and the Sponsor personnel may ultimately determine (if necessary). These prompt payment requirements apply to both DBE and non-DBE subcontractors.

All contractors and subcontractors must retain records of all payments, made or received, for 3 years from the date of final payment and must be available for inspection, upon request, by any authorized representative of MoDOT, the Sponsor or USDOT. MoDOT and the city will maintain records of actual payments to DBE firms for work committed to at the time of contract award.

MoDOT and the Sponsor will perform audits of contract payments to firms. The audits will review payments to subcontractors to ensure that the actual amount paid to DBE subcontractors equals or exceeds the dollar amounts stated in the schedule of DBE participation and that payment was made in compliance with Missouri Revised Statutes, Chapter 34, Section 34.057.

MISSOURI REVISED STATUTES

Chapter 34 State Purchasing and Printing Section 34.057

August 28, 2014

Public works contracts--prompt payment by public owner to contractor, engineer, architect, or surveyor--prompt payment by contractor to subcontractor-- progress payments--retainage--late payment charges-- withholding of payments.

34.057. 1. Unless contrary to any federal funding requirements or unless funds from a state grant are not timely received by the contracting public municipality but notwithstanding any other law to the contrary, all public works contracts made and awarded by the appropriate officer, board or agency of the state or of a political subdivision of the state or of any district therein, including any municipality, county and any board referred to as the public owner, for construction, reconstruction or alteration of any public works project, shall provide for prompt payment by the public owner to the contractor, and any professional engineer, architect, landscape architect, or land

surveyor, as well as prompt payment by the contractor to the subcontractor and material supplier in accordance with the following:

(1) A public owner shall make progress payments to the contractor and any professional engineer, architect, landscape architect or land surveyor on at least a monthly basis as the work progresses, or, on a lump sum basis according to the terms of the lump sum contract. Except in the case of lump sum contracts, payments shall be based upon estimates prepared at least monthly of work performed and material delivered, as determined by the project architect or engineer. Retainage withheld on any construction contract or subcontract for public works projects shall not exceed five percent of the value of the contract or subcontract. If the contractor is not required to obtain a bond under section 107.170 because the cost of the public works contract is not estimated to exceed fifty thousand dollars, the public owner may withhold retainage on the public works project in an amount not to exceed ten percent of the value of the contract or subcontract. The public owner shall pay the contractor the amount due, less a retainage, within thirty days following the latter of the following:

(a) The date of delivery of materials or construction services purchased;

(b) The date, as designated by the public owner, upon which the invoice is duly delivered to the person or place designated by the public owner; or

(c) In those instances in which the contractor approves the public owner's estimate, the date upon which such notice of approval is duly delivered to the person or place designated by the public owner;

(2) Payments shall be considered received within the context of this section when they are duly posted with the United States Postal Service or other agreed upon delivery service or when they are hand-delivered to an authorized person or place as agreed to by the contracting parties;

(3) If, in the discretion of the owner and the project architect or engineer and the contractor, it is determined that a subcontractor's performance has been completed and the subcontractor can be released prior to substantial completion of the public works contract without risk to the public owner, the contractor shall request such adjustment in retainage, if any, from the public owner as necessary to enable the contractor to pay the subcontractor in full. The public owner may reduce or eliminate retainage on any contract payment if, in the public owner's opinion, the work is proceeding satisfactorily. If retainage is released and there are any remaining minor items to be completed, an amount equal to one hundred fifty percent of the value of each item as determined by the public owner's duly authorized representatives shall be withheld until such item or items are completed;

(4) The public owner shall pay at least ninety-eight percent of the retainage, less any offsets or deductions authorized in the contract or otherwise authorized by law, to the contractor. The contractor shall pay the subcontractor or supplier after substantial completion of the contract work and acceptance by the public owner's authorized contract representative, or as may otherwise be provided by the contract specifications for state highway, road or bridge projects administered by the state highways and transportation commission. Such payment shall be made within thirty days after acceptance, and the invoice and all other appropriate documentation and certifications in complete and acceptable form are provided, as may be required by the contract documents. If the public owner or the owner's representative determines the work is not substantially completed and accepted, then the owner or the owner's representative shall provide a written explanation of why the work is not considered substantially completed and accepted within fourteen calendar days to the contractor, who shall then provide such notice to the subcontractor or suppliers responsible for such work. If such written explanation is not given by the public body, the public body shall pay at least ninety-eight percent of the retainage within thirty calendar days. If at that time there are any remaining minor items to be completed, an amount equal to one hundred fifty percent of the value of each item as determined by the public owner's representative shall be withheld until such items are completed;

(5) All estimates or invoices for supplies and services purchased, approved and processed, or final payments, shall be paid promptly and shall be subject to late payment charges provided in this section. Except as provided in subsection 4 of this section, if the contractor has not been paid within thirty days as set forth in subdivision (1) of

3178 subsection 1 of this section, the contracting agency shall pay the contractor, in addition to the payment due him,
3179 interest at the rate of one and one-half percent per month calculated from the expiration of the thirty-day period
3180 until fully paid;

3181
3182 (6) When a contractor receives any payment, the contractor shall pay each subcontractor and material supplier in
3183 proportion to the work completed by each subcontractor and material supplier his application less any retention
3184 not to exceed five percent. If the contractor receives less than the full payment due under the public construction
3185 contract, the contractor shall be obligated to disburse on a pro rata basis those funds received, with the contractor,
3186 subcontractors and material suppliers each receiving a prorated portion based on the amount of payment. When,
3187 however, the public owner does not release the full payment due under the contract because there are specific areas
3188 of work or materials he is rejecting or because he has otherwise determined such areas are not suitable for payment
3189 then those specific subcontractors or suppliers involved shall not be paid for that portion of the work rejected or
3190 deemed not suitable for payment; provided the public owner or the owner's representative gives a written
3191 explanation to the contractor, subcontractor, or supplier involved as to why the work or supplies were rejected or
3192 deemed not suitable for payment, and all other subcontractors and suppliers shall be paid in full;

3193
3194 (7) If the contractor, without reasonable cause, fails to make any payment to his subcontractors and material
3195 suppliers within fifteen days after receipt of payment under the public construction contract, the contractor shall
3196 pay to his subcontractors and material suppliers, in addition to the payment due them, interest in the amount of
3197 one and one-half percent per month, calculated from the expiration of the fifteen-day period until fully paid. This
3198 subdivision shall also apply to any payments made by subcontractors and material suppliers to their subcontractors
3199 and material suppliers and to all payments made to lower tier subcontractors and material suppliers throughout the
3200 contracting chain;

3201
3202 (8) The public owner shall make final payment of all moneys owed to the contractor, including any retainage
3203 withheld under subdivision (4) of this subsection, less any offsets or deductions authorized in the contract or
3204 otherwise authorized by law, within thirty days of the due date. Final payment shall be considered due upon the
3205 earliest of the following events:

3206
3207 (a) Completion of the project and filing with the owner of all required documentation and certifications, in
3208 complete and acceptable form, in accordance with the terms and conditions of the contract;

3209 (b) The project is certified by the architect or engineer authorized to make such certification on behalf of the
3210 owner as having been completed, including the filing of all documentation and certifications required by the
3211 contract, in complete and acceptable form; or

3212
3213 (c) The project is certified by the contracting authority as having been completed, including the filing of all
3214 documentation and certifications required by the contract, in complete and acceptable form.

3215
3216 (9) Nothing in this section shall prevent the contractor or subcontractor, at the time of application or certification
3217 to the public owner or contractor, from withholding such applications or certifications to the owner or contractor
3218 for payment to the subcontractor or material supplier. Amounts intended to be withheld shall not be included in
3219 such applications or certifications to the public owner or contractor. Reasons for withholding such applications or
3220 certifications shall include, but not be limited to, the following: unsatisfactory job progress; defective construction
3221 work or material not remedied; disputed work; failure to comply with other material provisions of the contract;
3222 third-party claims filed or reasonable evidence that a claim will be filed; failure of the subcontractor to make timely
3223 payments for labor, equipment and materials; damage to a contractor or another subcontractor or material supplier;
3224 reasonable evidence that the contract cannot be completed for the unpaid balance of the subcontract sum or a
3225 reasonable amount for retention, not to exceed the initial percentage retained by the owner.

3226
3227 (10) Should the contractor determine, after application or certification has been made and after payment has been
3228 received from the public owner, or after payment has been received by a contractor based upon the public owner's
3229 estimate of materials in place and work performed as provided by contract, that all or a portion of the moneys
3230 needs to be withheld from a specific subcontractor or material supplier for any of the reasons enumerated in this
3231 section, and such moneys are withheld from such subcontractor or material supplier, then such undistributed

amounts shall be specifically identified in writing and deducted from the next application or certification made to the public owner or from the next estimate by the public owner of payment due the contractor, until a resolution of the matter has been achieved. Disputes shall be resolved in accordance with the terms of the contract documents. Upon such resolution the amounts withheld by the contractor from the subcontractor or material supplier shall be included in the next application or certification made to the public owner or the next estimate by the public owner and shall be paid promptly in accordance with the provisions of this section. This subsection shall also apply to applications or certifications made by subcontractors or material suppliers to the contractor and throughout the various tiers of the contracting chain.

(11) The contracts which provide for payments to the contractor based upon the public owner's estimate of materials in place and work performed rather than applications or certifications submitted by the contractor, the public owner shall pay the contractor within thirty days following the date upon which the estimate is required by contract to be completed by the public owner, the amount due less a retainage not to exceed five percent. All such estimates by the public owner shall be paid promptly and shall be subject to late payment charges as provided in this subsection. After the thirtieth day following the date upon which the estimate is required by contract to be completed by the public owner, the contracting agency shall pay the contractor, in addition to the payment due him, interest at a rate of one and one-half percent per month calculated from the expiration of the thirty-day period until fully paid.

(12) The public owner shall pay or cause to be paid to any professional engineer, architect, landscape architect, or land surveyor the amount due within thirty days following the receipt of an invoice prepared and submitted in accordance with the contract terms. In addition to the payment due, the contracting agency shall pay interest at the rate of one and one-half percent per month calculated from the expiration of the thirty-day period until fully paid.

(13) Nothing in this section shall prevent the owner from withholding payment or final payment from the contractor, or a subcontractor or material supplier. Reasons for withholding payment or final payment shall include, but not be limited to, the following: liquidated damages; unsatisfactory job progress; defective construction work or material not remedied; disputed work; failure to comply with any material provision of the contract; third party claims filed or reasonable evidence that a claim will be filed; failure to make timely payments for labor, equipment or materials; damage to a contractor, subcontractor or material supplier; reasonable evidence that a subcontractor or material supplier cannot be fully compensated under its contract with the contractor for the unpaid balance of the contract sum; or citation by the enforcing authority for acts of the contractor or subcontractor which do not comply with any material provision of the contract and which result in a violation of any federal, state or local law, regulation or ordinance applicable to that project causing additional costs or damages to the owner.

(14) Nothing in this section shall be construed to require direct payment by a public owner to a subcontractor or supplier, except in the case of the default, as determined by a court, of the contractor on the contract with the public owner where no performance or payment bond is required or where the surety fails to execute its duties, as determined by a court.

(15) Notwithstanding any other provisions in this section to the contrary, no late payment interest shall be due and owing for payments which are withheld in good faith for reasonable cause pursuant to subsections 2, 5 and 6 of this section. If it is determined by a court of competent jurisdiction that a payment which was withheld pursuant to subsections 2, 5 and 6 of this section was not withheld in good faith for reasonable cause, the court may impose interest at the rate of one and one-half percent per month calculated from the date of the invoice and may, in its discretion, award reasonable attorney fees to the prevailing party. In any civil action or part of a civil action brought pursuant to this section, if a court determines after a hearing for such purpose that the cause was initiated, or a defense was asserted, or a motion was filed, or any proceeding therein was done frivolously and in bad faith, the court shall require the party who initiated such cause, asserted such defense, filed such motion, or caused such proceeding to be had to pay the other party named in such action the amount of the costs attributable thereto and reasonable expenses incurred by such party, including reasonable attorney fees.

(L. 1990 S.B. 808 & 672 § 1, A.L. 2014 S.B. 529)

3286 (2004) Act contemplates a contract between the parties to such a cause of action and provides for such action
3287 against a public owner only by the contractor, not a subcontractor or supplier. *Mays-Maune & Associates v. Werner*
3288 *Brothers*, 139 S.W.3d 201 (Mo.App. E.D.).
3289

3290 **MoDOT DBE Program Regulations.** The Sponsor, contractor and each subcontractor are bound by the new
3291 MoDOT DBE Program regulations at Title 7 CSR, Division 10, Chapter 8.
3292

3293 *Reference: 49 CFR Part 26*
3294
3295

3296 5. ENERGY CONSERVATION REQUIREMENTS 3297

3298 Contractor and Subcontractor agrees to comply with mandatory standards and policies relating to energy
3299 efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy
3300 and Conservation Act (42 U.S.C. 6201 *et seq*).
3301

3302 *Reference: 2 CFR § 200 Appendix II(H)*
3303
3304

3305 6. BREACH OF CONTRACT TERMS 3306

3307 Any violation or breach of terms of this contract on the part of the Contractor or its subcontractors may
3308 result in the suspension or termination of this contract or such other action that may be necessary to
3309 enforce the rights of the parties of this agreement.
3310

3311 Owner will provide Contractor written notice that describes the nature of the breach and corrective
3312 actions the Contractor must undertake in order to avoid termination of the contract. The Owner reserves
3313 the right to withhold payments to the Contractor until such time the Contractor corrects the breach or
3314 the Owner elects to terminate the contract. The Owner's notice will identify a specific date by which the
3315 Contractor must correct the breach. The Owner may proceed with termination of the contract if the
3316 Contractor fails to correct the breach by the deadline indicated in the Owner's notice.
3317

3318 The duties and obligations imposed by the Contract Documents and the rights and remedies available
3319 thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise
3320 imposed or available by law.
3321

3322 *Reference: 2 CFR § 200 Appendix II(A)*
3323
3324

3325 7. VETERAN'S PREFERENCE 3326

3327 In the employment of labor (excluding executive, administrative, and supervisory positions), the
3328 Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title
3329 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf
3330 veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15
3331 U.S.C. 632) owned and controlled by disabled veterans. This preference only applies when there are
3332 covered veterans readily available and qualified to perform the work to which the employment relates.
3333

3334 *References: Title 49 U.S.C. 47112(c)*
3335
3336
3337

3338 **8. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION CONSTRUCTION**
3339 **SAFETY TRAINING**
3340

3341 The Contractor and its subcontractors (if any subcontractors are retained) shall comply with all applicable
3342 provisions of section 292.675, Revised Statutes of Missouri, which statute is incorporated herein by
3343 reference and is made a part of this contract. Section 292.675 states that any person signing a contract to
3344 work on the construction of public works for any public body shall provide a ten hour Occupational Safety
3345 and Health Administration (OSHA) construction safety program for their on-site employees, which
3346 includes a course in construction safety and health approved by OSHA or a similar program approved by
3347 the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA
3348 program, unless such employees have previously completed the required program and hold documentation
3349 of such prior completion. All employees who have not previously completed the program are required to
3350 complete the program within sixty (60) days of beginning work on such construction project. Any
3351 employee found on a worksite subject to section 292.675's requirements without documentation of the
3352 successful completion of this course shall have twenty (20) days to produce such documentation before
3353 being subject to removal from the project.
3354

3355 The Contractor shall forfeit as penalty to the public body on whose behalf the contract is made or awarded
3356 two thousand five hundred dollars (\$2,500) plus one hundred dollars (\$100) for each employee employed
3357 by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed
3358 by the contractor or subcontractor without the required training. These penalties shall not begin to accrue
3359 until the sixty (60) day and twenty (20) day time periods described above have elapsed. The public body
3360 awarding the contract shall withhold and retain therefrom all sums and amounts due and owing as a result
3361 of any violation of section 292.675 when making payments to the Contractor under the contract. The
3362 Contractor may withhold from any subcontractor sufficient sums to cover any penalties the public body
3363 has withheld from the Contractor resulting from the subcontractor's failure to comply with the terms of
3364 section 292.675.
3365

3366 **9 DAVIS BACON REQUIREMENTS**
3367

3368 **9.1 Minimum Wages.**
3369

- 3370 (i) All laborers and mechanics employed or working upon the site of the work will be paid
3371 unconditionally and not less often than once a week, and without subsequent deduction or
3372 rebate on any account (except such payroll deductions as are permitted by the Secretary of
3373 Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide
3374 fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less
3375 than those contained in the wage determination of the Secretary of Labor which is attached
3376 hereto and made a part hereof, regardless of any contractual relationship which may be
3377 alleged to exist between the contractor and such laborers and mechanics.
3378

3379 Contributions made or costs reasonably anticipated for bona fide fringe benefits under
3380 section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered
3381 wages paid to such laborers or mechanics, subject to the provisions of paragraph 9.1(iv) of
3382 this section; also, regular contributions made or costs incurred for more than a weekly period
3383 (but not less often than quarterly) under plans, funds, or programs which cover the particular
3384 weekly period, are deemed to be constructively made or incurred during such weekly period.
3385 Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on
3386 the wage determination for the classification of work actually performed, without regard to
3387 skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in
3388 more than one classification may be compensated at the rate specified for each classification
3389 for the time actually worked therein: *Provided*, That the employer's payroll records accurately
3390 set forth the time spent in each classification in which work is performed. The wage
3391 determination (including any additional classification and wage rates conformed under 9.1(ii)

of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii)

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

(1) The work to be performed by the classification requested is not performed by a classification in the wage determinations; and

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

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

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

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

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs 9.1(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

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

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

may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

9.2 Withholding. The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

9.3 Payrolls and basic records.

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

(ii) (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (*e.g.*, the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each

covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

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

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i) and that such information is correct and complete;

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

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

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

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

(iii) The contractor or subcontractor shall make the records required under paragraph 9.3(i) of this section available for inspection, copying or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

9.4 Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with

a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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

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

9.5 Compliance With Copeland Act Requirements. The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

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

9.7 Contract Termination: Debarment. A breach of the contract clauses in paragraphs 9.1 through 9.10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

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

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

9.10 Certification of Eligibility.

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

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

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

Reference: 2 CFR § 200 Appendix II(D), 29 CFR Part 5

10. EQUAL EMPLOYMENT OPPORTUNITY CLAUSE AND SPECIFICATIONS

EQUAL OPPORTUNITY CLAUSE

During the performance of this contract, the contractor agrees as follows:

10.1 The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without

regard to their race, color, religion, sex, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

10.2 The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

10.3 The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

10.4 The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

10.5 The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

10.6 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law

10.7 The contractor will include the portion of the sentence immediately preceding paragraph 10.1 and the provisions of paragraphs 10.1 through 10.7 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS**

10.8. As used in these specifications:

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

10.9. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

10.10. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

10.11. The contractor shall implement the specific affirmative action standards provided in paragraphs 10.14a through 10.14p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established

for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

10.12. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.

10.13. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the contractor during the training period and the contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

10.14. The contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or female sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs,

3816 especially those programs funded or approved by the Department of Labor. The contractor
3817 shall provide notice of these programs to the sources compiled under 10.8b above.
3818

- 3819 f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and
3820 training programs and requesting their cooperation in assisting the contractor in meeting its
3821 EEO obligations; by including it in any policy manual and collective bargaining agreement;
3822 by publicizing it in the company newspaper, annual report, etc.; by specific review of the
3823 policy with all management personnel and with all minority and female employees at least
3824 once a year; and by posting the company EEO policy on bulletin boards accessible to all
3825 employees at each location where construction work is performed.
3826
- 3827 g. Review, at least annually, the company's EEO policy and affirmative action obligations under
3828 these specifications with all employees having any responsibility for hiring, assignment, layoff,
3829 termination, or other employment decisions including specific review of these items with
3830 onsite supervisory personnel such as superintendents, general foremen, etc., prior to the
3831 initiation of construction work at any job site. A written record shall be made and maintained
3832 identifying the time and place of these meetings, persons attending, subject matter discussed,
3833 and disposition of the subject matter.
3834
- 3835 h. Disseminate the contractor's EEO policy externally by including it in any advertising in the
3836 news media, specifically including minority and female news media, and providing written
3837 notification to and discussing the contractor's EEO policy with other contractors and
3838 subcontractors with whom the contractor does or anticipates doing business.
3839
- 3840 i. Direct its recruitment efforts, both oral and written, to minority, female, and community
3841 organizations, to schools with minority and female students; and to minority and female
3842 recruitment and training organizations serving the contractor's recruitment area and
3843 employment needs. Not later than one month prior to the date for the acceptance of
3844 applications for apprenticeship or other training by any recruitment source, the contractor
3845 shall send written notification to organizations, such as the above, describing the openings,
3846 screening procedures, and tests to be used in the selection process.
3847
- 3848 j. Encourage present minority and female employees to recruit other minority persons and
3849 women and, where reasonable provide after school, summer, and vacation employment to
3850 minority and female youth both on the site and in other areas of a contractor's workforce.
3851
- 3852 k. Validate all tests and other selection requirements where there is an obligation to do so under
3853 41 CFR Part 60-3.
3854
- 3855 l. Conduct, at least annually, an inventory and evaluation at least of all minority and female
3856 personnel, for promotional opportunities and encourage these employees to seek or to
3857 prepare for, through appropriate training, etc., such opportunities.
3858
- 3859 m. Ensure that seniority practices, job classifications, work assignments, and other personnel
3860 practices do not have a discriminatory effect by continually monitoring all personnel and
3861 employment related activities to ensure that the EEO policy and the contractor's obligations
3862 under these specifications are being carried out.
3863
- 3864 n. Ensure that all facilities and company activities are non-segregated except that separate or
3865 single user toilet and necessary changing facilities shall be provided to assure privacy between
3866 the sexes.
3867

- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the contractor's EEO policies and affirmative action obligations.

10.15. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (10.14a through 10.14p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 10.14a through 10.14p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.

10.16. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally,) the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10.17. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

10.18. The contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

10.19. The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

10.20. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 10.14 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

10.21. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours

worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

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

References: 2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, 41 CFR § 60-4.3, Executive Order 11246

11. PROHIBITION OF SEGREGATED FACILITIES

- 11.1 The contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will permit its employees to perform their services at any location under its control where segregated facilities are maintained. The contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

- 11.2 "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employees custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

- 11.3 The contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

References: 41 CFR § 60.

12. AFFIRMATIVE ACTION REQUIREMENT

- 12.1** The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

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

Timetables:

-Goals for minority participation for each trade: 4.00
(Vol.45 Federal Register pg. 65984 10/3/80

[Participation Goals for Minorities and Females](#)

-Goals for female participation in each trade: 6.9% (Nationwide Percentage)

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

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

12.3 The contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP), within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed

12.4 As used in this notice and in the contract resulting from this solicitation, the "covered area" is **Kirksville, Adair County, in the State of Missouri.**

References: 41 CFR Part 60-4, Executive Order 11246

13. TERMINATION OF CONTRACT

13.1 Termination of Convenience (Construction and Equipment Contracts):

The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts under this clause:

- a. Contractor must immediately discontinue work as specified in the written notice.
- b. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
- c. Discontinue orders for materials and services except as directed by the written notice.
- d. Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work and as directed in the written notice.
- e. Complete performance of the work not terminated by the notice.

- f. Take action as directed by the Owner to protect and preserve property and work related to this contract of which Owner will take possession.

Owner agrees to pay Contractor for:

- a. Completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;
- b. Documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;
- c. Reasonable and substantiated claims, costs and damages incurred in settlement of terminated contracts with subcontractors and suppliers; and
- d. Reasonable and substantiated expenses to the contractor directly attributable to Owner's termination action.

Owner will not pay Contractor for loss of anticipated profits or revenues or other economic loss arising out of or resulting from the Owner's termination action.

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

13.2 Termination for Default (Construction):

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

13.3 Termination for Default (Equipment):

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

- a. Fails to commence the Work under the Contract within the time specified in the Notice to Proceed;
- b. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;
- c. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;
- d. Fails to comply with material provisions of the Contract;
- e. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements;
- f. Becomes insolvent or declares bankruptcy;

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

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

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

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

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

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

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

14. CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

14.1 Overtime Requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such work week.

14.2 Violation; Liability for Unpaid Wages; Liquidated Damages. In the event of any violation of the clause set forth in paragraph 14.1 above, the contractor or any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 14.1 above, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 14.1 above.

14.3 Withholding for Unpaid Wages and Liquidated Damages. The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy

any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 14.2 of this clause.

14.4 Subcontractors. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 14.1 through 14.4 and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 14.1 through 14.4 of this clause.

References: 2 CFR § 200 Appendix II (E)

15. CLEAN AIR AND WATER POLLUTION CONTROL

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). The Contractor agrees to 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.

References: 2 CFR § 200 Appendix II(G)

16. BUY AMERICAN PREFERENCE

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

A bidder or offeror must complete and submit the Buy America certification included in Section B of the Contractor Documents with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

References: Title 49 U.S.C. § 50101

17. COPELAND “ANTI-KICKBACK” ACT

Contractor must comply with the requirements of the Copeland “Anti-Kickback” Act (18 U.S.C. 874 and 40 U.S.C. 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractor are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The contractor and each subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violation of the Act to the Federal Aviation Administration.

Reference: 2 CFR § 200 Appendix II(D), 29 CFR parts 3 & 5

4189 **18. FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)**

4190
4191 All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of
4192 29 CFR par 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given
4193 in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for
4194 full and part time workers. The contractor has full responsibility to monitor compliance to the referenced
4195 statute or regulation. The contractor must address any claims or disputes that arise from this requirement
4196 directly with the U.S. Department of Labor – Wage and Hour Division.

4197
4198 *Reference: 29 USC § 201, et seq.*
4199

4200
4201 **19. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970**

4202
4203 All contracts and subcontracts that result from this solicitation incorporate by reference the requirements
4204 of 29 CFR Part 1910 with the same force and effect as if given in full text. Contractor must provide a
4205 work environment that is free from recognized hazards that may cause death or serious physical harm to
4206 the employee. The contractor retains full responsibility to monitor its compliance and their subcontractor's
4207 compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR
4208 Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement
4209 directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

4210
4211 *Reference: 20 CFR part 1910*
4212

4213
4214 **20. DISTRACTED DRIVING**

4215
4216 **Texting When Driving.** In accordance with Executive Order 13513, "Federal Leadership on Reducing
4217 Text Messaging While Driving" (10/1/2009) and DOT Order 3902.10 "Text Messaging While Driving"
4218 (12/30/2009), THE FAA encourages recipients of Federal grant funds to adopt and enforce safety
4219 policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving
4220 when performing work related to a grant or sub-grant.

4221 In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for
4222 its employees and other work personnel that decrease crashes by distracted drivers, including policies that
4223 ban text messaging while driving motor vehicles while performing work activities associated with the
4224 project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500
4225 and involve driving a motor vehicle in performance of work activities associated with the project.

4226
4227 *Reference: Executive Order 13513, and DOT Order 3902.10*
4228

4229
4230 **21. PROCUREMENT OF RECOVERED MATERIALS**

4231
4232 Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as
4233 amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part
4234 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors
4235 are to use products containing the highest percentage of recovered materials for items designated by the
4236 Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

- 4237
4238 a. The contract requires procurement of \$10,000 or more of a designated item during the fiscal year;
4239 or,
4240 b. The contractor has procured \$10,000 or more of a designated item using Federal funding during
4241 the previous fiscal year.

The list of EPA-designated items is available at www.epa.gov/epawaste/conserve/tools/cpg/products/.

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the contractor can demonstrate the item is:

- a. Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
- b. Fails to meet reasonable contract performance requirements; or
- c. Is only available at an unreasonable price.

Reference: 2 CFR § 200.322, 40 CFR Part 247

22. RIGHTS TO INVENTIONS

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

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

23. SEISMIC SAFETY

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

Reference: 49 CFR Part 41

23. CERTIFICATION OF BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS (Sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014, DOT Order 4200.6)

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

Certifications

- (1) The bidder represents that it is () is not () a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have

4294 been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to
4295 an agreement with the authority responsible for collecting the tax liability.
4296

- 4297 (2) The bidder represents that it is () is not () a corporation that was convicted of a
4298 criminal violation under any Federal law within the preceding 24 months.
4299

4300 Note: If a bidder responds in the affirmative to either of the above representations, the bidder is
4301 ineligible to receive an award unless the Sponsor has received notification from the agency
4302 suspension and debarment official (SDO) that the SDO has considered suspension or debarment
4303 and determined that further action is not required to protect the Government's interests. The
4304 bidder therefore must provide information to the Sponsor about its tax liability or conviction to
4305 the Sponsor, who will then notify MoDOT and/or the FAA, which will then notify the agency's
4306 SDO to facilitate completion of the required considerations before award decisions are made.
4307

4308 Term Definitions:
4309

4310 Felony Conviction: Felony conviction means a conviction within the preceding twenty-four (24)
4311 months of a felony criminal violation under any Federal law and includes conviction of an offense
4312 defined in a section of the U.S. code that specifically classifies the offense as a felony and
4313 conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.
4314

4315 Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for
4316 which all judicial and administrative remedies have been exhausted, or have lapsed, and that is
4317 not being paid in a timely manner pursuant to an agreement with the authority responsible for
4318 collecting the tax liability.
4319

Intentionally Left Blank

4320
4321

PART B
DBE ADMINISTRATION

1. Eligibility of DBEs:

Only those firms currently certified as DBEs by the Missouri Department of Transportation (MoDOT), City of St. Louis, Metro, City of Kansas City, and Kansas City Area Transportation Authority are eligible to participate as DBEs on this contract. A list of these firms is available on MoDOT's Office of External Civil Rights webpage at the following address:

<http://www.modot.org/dbe-program/mrcc-directory>

2. Counting DBE Participation Towards DBE Goals:

DBE participation toward attainment of the goal will be computed on the basis of the subcontract prices agreed to between the contractor and subcontractors for the contract items or portions of items being sublet, as shown on the DBE Participation Form and attachments. Credit will only be given for use of DBEs that are certified or accepted according to this specification. DBE participation shall be counted toward meeting the DBE goal in accordance with the following:

a. Commercially Useful Function:

The Sponsor shall count toward the DBE goal only those expenditures to DBEs that perform a commercially useful function in the work of the contract. A DBE performs a commercially useful function when it is responsible for execution of a distinct element of work by actually performing, managing, and supervising that work. To determine if a DBE is performing a commercially useful function, the amount of work subcontracted, industry practices, and other relevant factors will be evaluated. If consistent with industry practices, a DBE shall enter into a subcontract or other contractual written agreement. A DBE Contractor may subcontract a portion of the work up to the amount allowed under standard subcontracting contract provisions of normal industry practices. A DBE is presumed not to be performing a commercially useful function if the DBE is performing outside these guidelines.

b. Materials and Supplies:

The Sponsor shall count toward the DBE goal the expenditures for materials and supplies obtained from DBE suppliers and manufacturers as described below. The DBEs must assume the actual and contractual responsibility for the provision of the materials and supplies:

- (1) The entire expenditure to a DBE manufacturer will be counted toward the DBE goal. A manufacturer must operate or maintain a factory or establishment that produces on the premises the materials or supplies that are obtained by the contractor.
- (2) Sixty percent of expenditures to a DBE regular dealer will be counted toward the DBE goal. A regular dealer must perform a commercially useful function in the supply process including buying the materials or supplies, maintaining an inventory and regularly selling materials to the public. Bulk items such as steel, cement, gravel, stone and petroleum products need not be kept in stock, but the dealer must own or operate distribution equipment.
- (3) No credit will be given toward the DBE goal if the prime contractor makes a direct payment to a non-DBE material supplier. However, it will be permissible for a material supplier to invoice the prime contractor and the DBE jointly and be paid by the prime contractor making remittance to the DBE firm and material supplier jointly.

(4) No credit toward the DBE goal will be given for the cost of materials or equipment used in a DBE firm's work when those costs are paid by a deduction from the prime contractor's payment(s) to the DBE firm.

c. Work Classifications: DBE credit will count toward the contractual goal only for work actually performed by the DBE firm and within the Standard Industry Classification (SIC) code approved for that firm. The credit will be counted in the following manner:

(1) Manufacturer: Credit is given for 100 percent of the value paid for materials furnished which become a permanent part of the project. A manufacturer is a firm that owns and operates the facilities to produce a product required by the project and purchased by the contractor.

(2) Supplier: Credit is given for 60 percent of the value paid for materials furnished which becomes a permanent part of the project. A supplier sells goods to the general public and maintains an inventory at an owned or leased warehouse or store. Bulk items such as steel, petroleum products, or rock do not have to be maintained in an on-site inventory. Credit will not be given for the cost of the materials and separate credit for the hauling of those same materials. Transportation of the materials is deemed part of the total cost.

(3) Broker: Credit is given for 100 percent of the **fees** or **commission** received by the DBE firm for materials purchased, services provided, or equipment secured and resold to the contractor. Fees or commissions are defined as the difference between what the DBE firm paid for the materials purchased, services provided, or equipment secured and the price paid by the contractor to the DBE firm for those items. A broker does not manufacture or supply on a regular basis.

(4) Trucker: Credit is given for 100 percent of the amount paid to the DBE trucker if that trucking is performed by the DBE, with employees of the DBE, using equipment owned or long-term leased by the DBE. However, if the DBE firm uses leased trucks, at least one truck owned by the firm **must** be used on the project.

Full credit will not be given for leased trucks unless they are leased on a long-term basis from another DBE firm, DBE owner operators, or a recognized commercial leasing operation. Firms licensed by the Missouri Public Service Commission as leasing agents qualify as a recognized leasing operation. Lease of trucks from the prime contractor will not be credited toward the DBE goal, other than possibly the portion constituting broker fees and commissions. This type of relationship will be subject to strict scrutiny.

All trucks used must be labeled clearly and visibly with a sign indicating the firm owning or leasing the vehicle. MoDOT will require submittal of a truck roster report, including ownership and vehicle identification information, on a regular basis. MoDOT project office or other designated personnel will review the rosters for verification and will monitor the trucks operating on the project. MoDOT will conduct random verification and report any irregularities to the External Civil Rights Unit for review.

In order for the use of a DBE trucker to be credited for the delivered price of materials supplies, the trucker must be certified as a supplier or manufacturer of the material, responsible for the quality standards of the material, negotiating the material price, payment, and select the source.

(a) Owner-Operator Trucking: The Sponsor shall count toward the DBE goal, the entire delivery fee paid to DBE owner-operators performing trucking for the contractor, if they appear on the contractor's payroll and separate records are furnished to the Sponsor documenting the expenditures. The records shall include for each owner-operator; their social security number; driver's license number; vehicle registration number; current vehicle license number; truck number; and a complete record of the contract fees paid to them.

If the DBE firm uses owner-operators to supplement their owned trucks, the DBE must be responsible for management and supervision of the entire trucking operation. The trucking arrangement or contract *cannot* be a contrived arrangement to meet the DBE goal. The DBE will be considered a broker, and only fees or commissions received will count toward the goal, if the DBE is not in full control, or does not have employees or trucks on the project.

- d. Joint Venture: When a joint venture contract is involved, the Sponsor shall count towards the DBE goal that portion of the contract total dollar value equal to the percentage of ownership and control of each DBE firm within the joint venture. Such crediting is subject to the sponsor's acceptance of the joint venture agreement. The Bidder must furnish the joint venture agreement with the DBE Participation Form. The joint venture agreement must include a detailed breakdown of the following:

- (1) Contract responsibility of the DBE for specific contract items of work,
- (2) Capital participation by the DBE,
- (3) Specific equipment to be provided by the DBE,
- (4) Specific responsibilities of the DBE regarding control of the joint venture,
- (5) Specific workers and skills to be provided by the DBE, and
- (6) Percentage distribution to the DBE of the projected profit or loss incurred by the joint venture.

The joint venture must be certified in writing by MoDOT.

3. Award Documentation and Procedure: All bidders shall certify in the Proposal Form their intent to meet or exceed the established goal or to demonstrate good faith efforts to meet the goal. Failure to make such certification or failure to demonstrate good faith efforts will render a bid non-responsive and will not be considered.

- a. DBE Participation Information: All bidders must complete the required DBE participation information in the Proposal Form, when a DBE goal has been established for the project. The information shall demonstrate the contractor's intended participation by certified DBEs. The information furnished shall consist of:

- (1) The names and addresses of DBE firms that will participate in the contract;
- (2) A description of the work that each DBE will perform;
- (3) The dollar amount of the participation of each DBE firm;
- (4) Written documentation (signed contract proposal) of the bidder/offeree's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal;
- (5) If the contract goal is not met, evidence of good faith efforts (see paragraph c below).

(Note: After award of the contract, the MoDOT External Civil Rights Office will contact by mail each DBE firm participating in the contract, requesting written confirmation from the DBE that it is participating in the contract as provided in the Proposal Form.)

- b. Sponsor Evaluation: In selecting the lowest responsible bidder, the Sponsor and MoDOT will evaluate the DBE information provided with the bid. The Sponsor and MoDOT may request additional DBE information. Prior to awarding the contract the Sponsor will verify verbally and/or in writing that the information submitted by the apparent successful bidder is accurate and complete.

- c. Good Faith Efforts: If the bidder is unable to meet the DBE goal, the bidder must submit, as part of its bid, written documentation and evidence of good faith efforts taken to meet the goal. Good faith efforts conducted after the bid opening will not be considered adequate to fulfill these bid requirements. Good faith efforts may include but are not limited to:

- 4482 (1) Efforts to select portions of the work for performance by DBEs, in order to increase the likelihood
4483 of achieving the DBE goal. This can include, but is not limited to, breaking down contracts into
4484 economically feasible units to facilitate DBE participation. Selection of portions of work shall be at
4485 least equal to the DBE goal.
4486
- 4487 (2) Written notification to individual DBEs likely to participate in the contract sent at least 7 calendar
4488 days prior to the bid opening. The notification shall list specific items or types of work and shall be
4489 sent to a reasonable number of DBE's qualified to participate in the contract.
4490
- 4491 (3) Efforts to negotiate with DBEs for specific items of work including:
4492
- 4493 (a) Names, addresses, and telephone numbers of DBEs who were contacted, the dates of initial
4494 contact and information on further contacts made to determine with certainty if the DBEs were
4495 interested. Personal or phone contacts are expected;
 - 4496 (b) Description of the information provided to the DBEs regarding the plans, specifications and
4497 estimated quantities for portions of the work to be performed;
 - 4498 (c) Individual statements as to why agreements with DBEs were not reached; and
 - 4499 (d) Information on each DBE contacted but rejected and the reasons for the rejection.
4500
- 4501 (4) Efforts to assist the DBEs that need assistance in obtaining bonding, insurance, or lines of credit
4502 required by the contractor.
4503
- 4504 (5) Documentation that qualified DBEs are not available or not interested.
4505
- 4506 (6) Advertisements in general circulation media, trade association publications and disadvantaged-focus
4507 media concerning subcontracting opportunities.
4508
- 4509 (7) Efforts to use the services of available disadvantaged community organizations; disadvantaged
4510 contractor's groups; local, state and federal disadvantaged business assistance offices; and other
4511 organizations that provide assistance in recruitment and placement of DBEs.
4512

4513 The demonstration of good faith efforts by the contractor must prove the contractor actively and aggressively
4514 sought out DBEs to participate in the project. The following actions would not be considered acceptable reasons
4515 for failure to meet the DBE goal and would not constitute a good faith effort:
4516

- 4517 (1) The DBE was unable to provide adequate performance and/or payment bonds.
- 4518 (2) A reasonable DBE bid was rejected based on price.
- 4519 (3) The DBE would not agree to perform the subcontract work at the prime contractors unit bid price.
- 4520 (4) Union versus non-union status of the DBE firm.
- 4521 (5) The prime contractor would normally perform all work included in this contract.
- 4522 (6) The prime contractor solicited DBE participation by mail only.
4523

4524 Should MoDOT and the city determine that the bidder's submitted documentation on good faith efforts are
4525 inadequate, the bidder must make a written request for administrative reconsideration within 2 working days of
4526 the notification on lack of good faith efforts. That notice may be faxed or emailed to:
4527

4528 **Lester Woods, Jr. External Civil Rights Director**
4529 **P.O. Box 270**
4530 **Jefferson City, Missouri 65102**
4531 **Telephone: (573) 751-2859**
4532 **Fax: (573) 526-0558**
4533 **E-Mail: Lester.WoodsJr@modot.mo.gov**
4534

The Administrative Reconsideration Committee will include 3 individuals MoDOT deems appropriate and the members will be familiar with the DBE program, bidding, construction, and/or contracting matters. The External Civil Rights Unit will process the request, including providing documentation of the determination, and notify the Administrative Reconsideration Committee of the request for review, however, the administrator, nor any member of MoDOT that had a part in the initial determination will be a part of the reconsideration determination.

As part of this reconsideration, the bidder will have the opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so to the committee. The bidder may choose to meet in person with the Administrative Reconsideration Committee to discuss the finding. MoDOT and the city will notify the bidder, in writing of the decision on reconsideration, explaining the basis for finding that the bidder did or did not make adequate good faith efforts to meet the goal. The result of the reconsideration process is not administratively appealable to the USDOT.

4. Post Award Compliance: If the contract is awarded on less than full DBE goal participation, the contractor is not relieved of the responsibility to make a determined effort to meet the full goal amount during the life of the contract. In such a case, the contractor shall continue good faith efforts throughout the life of the contract to increase the DBE participation to meet the contract goal.

If a DBE is unwilling or unable to perform the work specified, the contractor shall request from the Sponsor and FAA, relief from the obligation to use that DBE. Efforts will be made by the contractor to acquire from the DBE a letter which states the reason the DBE is unwilling or unable to complete its obligations under the project. If this results in a DBE contract shortfall, the contractor shall immediately take steps to obtain another certified DBE to perform an equal dollar value of allowable credit. If a new DBE cannot be found, the contractor shall submit evidence of good faith efforts within 15 calendar days of the request for relief. The contractor shall submit the new DBE's name, address, work items and the dollar amount of each item. The sponsor and the FAA shall approve the new DBE before the DBE starts work.

If the contractor fails to conform to the approved DBE participation or if it becomes evident that the remaining work will not meet the approved participation, then the contractor shall submit evidence showing either how the contractor intends to meet the DBE participation, or what circumstances have changed affecting the DBE participation. If the sponsor is not satisfied with the evidence, then liquidated damages may be assessed for the difference between the approved and actual DBE participation.

5. Records and Reports: The contractor shall keep records as necessary to determine compliance with the DBE obligations. The records shall include but are not limited to:
- a. Record of DBE Participation: The names of disadvantaged and non-disadvantaged subcontractors, regular dealers, manufacturers, consultant and service agencies; the type of work or materials or services performed on or incorporated in the project; and the actual value of such work.
 - b. Efforts to Utilize DBE Firms: Documentation of all efforts made to seek out disadvantaged contractor organizations and individual disadvantaged contractors for work on this project. All correspondence, personal contacts, telephone calls, etc., to obtain the services of DBE's should be documented.
 - c. Final DBE Certification: Upon completion of the individual DBE firm's work, the prime contractor shall submit a certification attesting to the actual work performed by the DBE firm and the amount paid the DBE firm. This certification shall be signed by both the prime contractor and the DBE firm.

Intentionally Left Blank

PART C – LOCAL PROVISIONS

1. HAUL ROADS:

The Contractor shall obtain approval from the Engineer prior to establishing haul roads within the airport property. Once established, the haul roads shall be utilized for all equipment traffic, and the equipment shall not be allowed to stray or wander away from the established routes. The haul roads shall be the responsibility of the Contractor and shall be maintained and kept in good order at all times. Water, when required, shall be applied at the locations and in the amounts necessary to minimize dust and dirt in the air operations area. Haul roads across any active runway or taxiway shall be kept clean and in good order at all times. The Contractor shall repair any damage caused by the movement of equipment on any of the haul roads, whether in designated or undesignated areas. After completion of the project, the Contractor shall be required to re-grade any unpaved portions of the haul road and to reseed the area with local native grasses to match the existing conditions of the area. The performance of any work as specified by this provision, including watering, maintenance, and repair of the haul roads, shall not be measured and paid for directly, but shall be considered as necessary and incidental to the work.

Establishment of haul roads off of Airport property shall be the sole responsibility of the Contractor.

2. AIRPORT SECURITY:

The Contractor will be required to submit to the airport prior to the commencement of construction, evidence in the form of a certification letter that all of their employees who will have unescorted access to the AOA have been checked for employment, security, and criminal history for the last ten years. The letter will also certify that these employees meet all security regulations as required by the Sponsor's security program.

During the course of the construction operations, the Contractor will be allowed to utilize a maximum of two (2) airport access "Security Gates" as entrance to the construction site. This gate and the associated haul roads shall be designated by the Engineer. The Contractor shall be required to keep this gate guarded and closed during construction hours. The gate may be opened only for authorized vehicle traffic flow. At such times as this gate is not guarded, it shall be closed and securely locked. The Contractor will be required to obtain an "airport security" permit from the Office of the Airport Manager for all vehicles and personnel used on the construction project. Said permit shall hold the Contractor responsible for all vehicles and personnel on the airport property other than those that have individual authorization. All authorized vehicles and construction equipment must display a three foot by three-foot flag with international orange and white 12-inch squares displayed in full view above the vehicles. Passengers in any authorized vehicles shall be the responsibility of the Contractor. The "gate guard" shall allow no unauthorized vehicle or person to enter the "air operations" side of the airport without the above stipulated "security clearance." The Contractor and the Contractor's "security gate guard" shall be held duly responsible to uphold the above security stipulations at all times during the progress of the construction project. No deviations from these security measures shall be allowed at any time. There shall be a \$1,000.00 penalty for each deviation from these security provisions.

3. RADIO COMMUNICATIONS:

The Contractor's superintendent and flagman shall be required to monitor transceiver radios tuned to the (Frequency) MHz frequency at all times. Radios shall be supplied by the Contractor. Such radios shall be used to obtain proper clearance in regard to the movement of equipment, trucks, etc., on the airport. Further, any unusual occurrences in the flight pattern of approaching or departing aircraft shall be acknowledged by all concerned so that operation of the airport and the construction work can be safely carried on at all times.

4641 **4. WORK SCHEDULE:**

4642
4643 Immediately after the award of contract, the Contractor shall file with the Engineer a time chart or
4644 schedule of proposed progress, a plan of construction and proposed detailed methods of carrying out the
4645 work, including a full statement of equipment and equipment layout for the job.
4646

4647 The Sponsor reserves the right to request changes in the sequence of project schedules if such change is
4648 required in the interest of safety or airport operation.
4649

4650 **5. CONTRACTOR'S QUALITY CONTROL PROGRAM:**

4651
4652 The contractor and their chosen testing laboratory shall submit a quality control plan submitted and
4653 approved prior to the Notice to Proceed (NTP). The quality control plan should contain the following
4654 items:
4655

- 4656 a. Names of testing laboratories and consulting engineer firms with quality control responsibilities
4657 on the project, together with a description of the services to be provided.
- 4658 b. Procedures for the testing laboratories to meet the requirements of the applicable ASTM,
4659 AASHTO or other standards referenced in the contract specifications.
- 4660 c. Qualifications of engineering supervision and construction inspection personnel.
- 4661 d. A listing of all tests required by the contract specifications, including the type and frequency of
4662 tests to be taken, the method of sampling, the applicable test standard, and the acceptance criteria
4663 or tolerance permitted for each type of test.
- 4664 e. Procedures for ensuring that the tests are taken in accordance with the program, that they are
4665 documented daily, that the proper corrective actions, where necessary, are undertaken, and that
4666 the quantity of materials used is adequate.
4667

4668 **6. SEQUENCE OF WORK:**

4669
4670 The Contractor will be required to accomplish the work items according to the schedule of construction
4671 as submitted to the Engineer following the award of the contract. Prior to closing any taxiways or apron
4672 area, they shall be marked in conformance with the FAA Advisory Circular 150/5340-1 latest edition.
4673 This shall consist of placing barricades and flashers on each taxiway and closed runway crosses on the
4674 effected runways. Flashers must be well anchored so they do not blow over from jet blasts or strong
4675 winds. Closed taxiway, apron area, and other airfield markings and maintenance of these items are
4676 considered a necessity and an incidental part of the work, and no separate measurement or payment will
4677 be made. The Contractor shall consider the costs and distribute them to the various bid items.
4678

4679
4680 The Contractor shall not allow men or equipment within **250** feet of any runway centerline or within **40**
4681 feet of the centerline of any taxiway, nor shall he permit materials to be stored or stocked within **400** feet
4682 of any runway centerline or within **66** feet of the centerline of any taxiway during the entire period of this
4683 project without first obtaining approval of the Engineer. When the Contractor's operations require the
4684 closing of any runway or taxiway, the Contractor shall mark said runway or taxiway in accordance with the
4685 plans and specifications at no additional cost to the Sponsor.
4686

4687
4688 Prior to construction on any taxiway or runway, the Contractor shall, upon approval by the Engineer,
4689 close the taxiway or runway and begin work. The Contractor shall be responsible for clearly marking and
4690 defining the closed taxiways or runways by use of warning lights, barricades, flags and closed taxiway or
4691 runway markings in conformance with FAA Advisory Circular 150/5370-2 latest edition. The Contractor
4692 shall be responsible for maintaining these barricades and keeping them clearly visible at all times.
4693
4694

The Sponsor shall meet with the Contractor immediately after the award of the contract to work up the sequence of work for the project.

7. CLOSURE OF AIR OPERATIONS AREAS:

Barricades are considered a necessary and incidental part of the work and no separate measurement or payment will be made therefore. The Contractor shall consider the costs and distribute them to the various bid items.

8. ACCIDENT PREVENTION:

Precautions shall be exercised at all times for the protection of persons (including employees) and property, and that the safety provisions of applicable laws and of applicable building construction codes shall be observed, and that machinery, equipment, and explosives shall be guarded and all hazards shall be eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

9. EXISTING UNDERGROUND CABLES:

The FAA shall attempt to locate all of their underground cables that are located in the vicinity of the work areas, prior to construction in the area. The Contractor shall attempt to locate the Sponsor's and all other public underground cables prior to construction. Damage to the underground cables through negligence on the part of the Contractor will require replacement by the Contractor at no cost to the Sponsor. Any splicing or replacing of damaged cable shall meet current FAA specifications.

10. UTILITIES:

Any utilities required by the Contractor for the prosecution of the work shall be paid for by said Contractor.

11. INDEMNIFICATION:

The Contractor agrees to indemnify and save harmless City of Kirksville/City of Kirksville, its officers, agents, and employees, against any and all damages to property or injuries to or death of any person or persons, including property and employees or agents of City of Kirksville/City of Kirksville, and further agrees to defend, indemnify and save harmless, City of Kirksville/City of Kirksville, its officers, agents, and employees from any claims, demands, suits, actions, proceedings of any kind or nature resulting from or arising out of operations in connection herewith, including operations of subcontractors and acts of omissions of employees or agents of the Contractor or his subcontractors.

12. SALES AND USE TAXES:

Construction and building materials sold to the contractors and subcontractors for use on public works owned by City of Kirksville, are exempt from State Sales and Use Taxes. However, such materials will be subject to any Sales and Use Taxes imposed by local cities and counties. This change in the State Tax Law has no effect of Sales and Use Taxes imposed by other local taxing authorities. Contractor shall provide proof of exemption prior to commencing work.

13. PERMITS AND COMPLIANCE WITH LAWS:

The Contractor shall procure and pay for all permits, licenses, and bonds necessary for the prosecution of his work, and/or required by Local, State, and Federal regulations and laws, as pertains particularly to permits and transportation of materials and equipment, or other operations which are not a specific

requirement of these specifications. The Contractor shall give all notices, pay all fees and taxes, and comply with all Federal, State, and Local laws, ordinances, rules, and regulations, and building and construction codes bearing on the conduct of the work.

14. EXECUTED CONTRACTS:

Each contract shall be executed in five original copies and there shall be executed originals of the Contractor's Performance Bond and Payment Bond in equal number to the executed originals of the contract. Two copies of such executed documents will be retained by City of Kirksville, one copy shall be delivered to the FAA, and two copies will be delivered to the Contractor. The cost of executing the Contract, bonds and insurance, including all notary fees and incidental expenses are to be paid by the Contractor to whom the contract is awarded.

15. SUBLETTING OR ASSIGNING OF CONTRACTS:

The Contractor shall perform, with his organization, an amount of work equal to at least 50 percent of the total contract cost. No assignment by the Contractor of any principal construction contract or any part thereof or of the funds to be received thereunder by the Contractor will be recognized unless such assignment has received the prior written approval of the Sponsor, which shall be at Sponsor's sole discretion, and the Surety has been given due notice of such assignment and has also consented in writing thereto.

Such written approval of the Sponsor shall not relieve the Contractor of any obligation incurred by him, under the contract, unless otherwise expressly stated in the approval.

The following language must appear in any assignment:

"It is agreed that the funds to be paid to the assignee under this assignment are subject to a prior lien for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms, or corporations rendering such services or supplying such materials."

16. QUALIFICATION OF DISADVANTAGED BUSINESS ENTERPRISES:

A Contractor, or subcontractor, will be considered as certified if that company has received a letter of certification from an organization, whose procedures for certifying business, is acceptable to the FAA.

A Contractor is permitted to use 100 percent of the Contract amount for the unit of work if the Contractor, or subcontractor, performs the construction, installation, rehabilitation, etc. of that work item(s).

A Contractor is permitted to use only 60 percent of the Contract amount for the purchase of material from a certified DBE supplier.

The Contractor is required to submit, to the Engineer, the names, work terms and contract value of all subcontractors, prior to commencing work. The Contractor is required to submit the names, work items and final contract amounts of all subcontractors after the substantial completion of the project

17. LIQUIDATED DAMAGES:

Subject to the provisions of the Contract Documents, the Sponsor shall be entitled to liquidated damages for failure of the Contractor to complete the work within the specified contract time.

The Contractor further agrees to pay liquidated damages for failure to complete the work within the specified contract time and for expenses incurred by the Sponsor for unscheduled employment of the Engineer during the contract time overrun.

As compensation for non-use, the Contractor shall be assessed a liquidated damage of \$\$750/Calendar Day(s) for each day that the work remains uncompleted beyond the contract period. As compensation for expenses incurred for unscheduled employment of the Engineer, up to \$1,730/Calendar day for the construction manager plus up to \$1,390/Calendar day for each additional resident engineer plus any incurred expenses (per diem, lodging, etc.) will be charged to the Contractor for that time which exceeds the number of Calendar Day(s) allowed in this paragraph. Further, each phase of work under the project has additional liquidated damage clauses, as outlined in Section 80-08 FAILURE TO COMPLETE ON TIME.

The Contractor further agrees to pay compensation for the unscheduled employment of the Engineer (and their Sub-Contractors) necessitated by the Contractor for any of the following: 1) working more than ten (10) hours per day, 2) furnishing materials or equipment not in conformance with the Contract Documents necessitating redesign, retesting, or additional review time by the Engineer and their Sub-Contractors, and 3) working beyond the time of completion established in the Notice to Proceed with Construction according to the following hourly rates:

<u>Description</u>	<u>Straight Time</u>
Staff Engineer	\$173/hr.
Engineer	\$139/hr.
Associate Engineer	\$128/hr.
Out of Pocket Cost, material, equipment, supplies, transportation, subsistence	At Cost

Compensation shall be paid by deduction from monthly progress payments and the final payment.

The engineering budget will be analyzed at the end of the project to determine whether any unscheduled employment of the Engineer, during the scheduled contract time, resulted in a cost savings to the Sponsor. If, as a result of working more than (10) ten hours per day, the Contractor completes the project within the scheduled contract time, and if the overtime results in a reduced contract time and cost savings to the Sponsor, no liquidated damages will be assessed for the unscheduled employment of the Engineer during the scheduled contract time. Liquidated damages will be assessed as stipulated for each day the work remains uncompleted beyond the scheduled contract time.

18. ACCEPTANCE TESTING:

Acceptance testing shall be the responsibility of the Engineer.

19. GRADE CONTROL AND SURFACE TOLERANCE:

The Contractor will be required to provide a minimum of one 2-person survey crew on site at all times during the work to assure compliance with Section 100 of the General Provisions and to provide the following at a minimum.

1. Provide all construction staking as required by Section 50 of the General Provisions.
2. Provide continuous straight edging records on a daily basis to the Engineer and under the direct observation/supervision of the Engineer as required. Submit results on forms provided by the Engineer. These will be accepted on a lot basis by the Engineer.
3. Provide daily grade tolerance surveys for completed courses of pavement to assure grade tolerances are being met. All survey data shall be provided in electronic ASCII format (or equivalent as approved by the engineer) and shall include Point Number, Northing, Easting, Elevation, and Description (PNEZD format). All point descriptions shall be coded in accordance

with the naming convention specified in the contractor's "Point Description Key Code" as provided to the engineer prior to the beginning of construction.

4. Assist in other verification surveys during roto-milling operations, field design adjustments, and as-built survey work as required at the direction of the Engineer.

20. CONSTRUCTION MANAGEMENT PLAN:

The Contractor and testing firm are required to prepare a Quality Control Program as required under SECTION 100, CONTRACTOR QUALITY CONTROL PROGRAM, of the General provisions. The Contractor shall obtain from the testing laboratory a proposed schedule of material testing submitted on forms provided by the Engineer, an example of which, is included following this specification. The requirements for the quality control program specified under Section 100 shall formulate a portion of the **CONSTRUCTION MANAGEMENT PLAN (CMP)** required under this item.

The Engineer will assemble and submit the CMP. The Contractor must complete sections of the CMP as indicated on the following pages. All sections indicated to be completed by the Contractor must be titled as shown. Other sections will be completed by the Engineer as indicated. The plan will be submitted to the Sponsor and FAA for approval a minimum of 10 days prior to construction. Approval of the CMP must be obtained prior to commencing any paving operations. Changes in the Contractor's personnel, sub-contractor's personnel, testing laboratory's personnel or testing procedures will require revision to the plan. The Contractor is required to submit any changes immediately to the Engineer.

The following outline shall be utilized as a guide for preparation of the CMP. Modifications may be incorporated as approved by the Engineer.

- I. Introduction/Summary (Completed by Engineer)
- II. Personnel
 1. Name of Sponsor representatives who have responsibility and authority for contract administration. (by Engineer)
 2. Consulting Engineer and staff showing qualifications, experience and project responsibilities. (by Engineer)
 3. Contractor project personnel and responsibilities. (by Contractor)
 4. Quality Control Testing Laboratory project personnel and responsibilities. (by Contractor)
 5. Acceptance Testing Laboratory project personnel and responsibilities (by Certified Testing Firm)
- III. Inspection Procedures and Frequencies (by Contractor) (Refer to Section 100)
- IV. Submittal Process (by Contractor) (Refer to Section 100)
- V. Quality Control Testing (by Contractor) (Refer to Section 100)
- VI. Acceptance Testing (by Certified Testing Firm)
- VII. Test Results

1. Quality Control Testing (by Contractor) (Refer to Section 100)
2. Acceptance Testing (by Certified Testing Laboratory)

VIII. Final Test and Quality Control Report (by Contractor)

At the end of the project and prior to final inspection and reduction of contract retainage, the prime contractor shall prepare and submit to the engineer for review and for FAA concurrence a final project summary report. Two bound copies and one loose leaf copy shall be submitted. The report shall include a summary of all tests taken with results, plus a narrative explaining the action taken for all failing tests within the context of the specifications. The Contractor shall correlate required tests shown in the specifications to those accomplished. Copies of all Certificates of Compliance for each material installed shall be included in the section pertaining to that material. Examples of typical Certificates of Compliance are for bituminous material, cement, fly ash, antistripping agent, pavement paint, etc. This summary shall contain all referenced material tests required by the Quality Control Program outlined in Section 100 of these specifications. In addition, it shall summarize all acceptance testing results.

The report shall be bound in booklet form with divisions for each bid item, i.e., excavation, base courses, pavement materials, electrical items, drainage items and any other materials. Each section shall be clearly marked with a divider including the section name and section table of contents. The report must contain a summary of all tests by lot or pay item, highlighted to indicate failed tests and/or reduced pay results, and reference to any approved change order that accepted any out of tolerance material. The individual sections shall begin with a narrative discussing any failed tests followed by a summary of the testing required and accomplished during the progress of the work. Within each section, the Contractor shall summarize individual test results in the format indicated on the following test summary forms provided by the Engineer. The forms are available in Microsoft Word format upon request. Additional or updated forms may be substituted by the Engineer prior to construction.

Any airfield lighting, electrical fixtures or other equipment used in the project shall have instruction books or factory installation sheets showing exploded views of the assembled parts with trouble shooting tips clearly shown. This information is of the type normally supplied by the manufacturer but must be in a presentable form. Single line wiring diagrams and circuit directories shall also be included in the summary with any recommended maintenance procedures suggested by the supplier or manufacturer.

Contractor is responsible for providing information before Notice to Proceed.

21. INSTRUCTION MANUALS:

At the end of project construction, the Contractor shall provide to the airport three instruction manuals. The manuals shall include as a minimum the following:

1. Names, addresses, and phone numbers of electrical equipment suppliers/manufacturers.
2. Component parts list with manufacturer and part number.
3. Final wiring diagrams of lighting control system (where a new control panel and/or control system is installed).
4. Equipment schematic and wiring diagrams showing all components cross referenced to the parts list.
5. Installation manuals.

- 4965 6. Maintenance and troubleshooting instruction.
4966
4967 7. Operating instructions.
4968
4969 8. Equipment Warranties.
4970

4971 Manuals for each piece of equipment provided shall be separated by dividers. The dividers shall be labeled
4972 accordingly. Three ring binders marked with the project schedule(s), date of final inspection, as well as
4973 Contractor's electrical subcontractors' names, addresses, and phone numbers.
4974

4975 **23. LAND DISTURBANCE PERMIT (LDP) AND STORMWATER POLLUTION**
4976 **PREVENTION PLAN (SWPPP):**
4977

4978 The construction of this project will require a LDP from the Missouri Department of Natural Resources
4979 (MoDNR). The Engineer and City are responsible for obtaining the LDP and development of the SWPPP.
4980 The LDP requires adherence to the SWPPP developed for this project. The Contractor is required to
4981 comply with both the LDP and SWPPP in addition to inspecting and maintaining erosion control
4982 measures as outlined in the Contract Plans and Specifications for this project.
4983

4984 If the Contractor fails to comply with the LDP, SWPPP, Contract Documents and Specifications, any
4985 penalties for LDP and SWPPP noncompliance assessed by MoDNR will be the responsibility of the
4986 Contractor and deducted from the awarded contract amount.
4987
4988

PART D

FEDERAL AND STATE WAGE RATES

4989 The Contractor shall post the prevailing wage rates on the project in a prominent and accessible place.
4990

4991 The Contractor and any Subcontractor shall submit weekly certified copies of their payrolls to the Owner. All
4992 payrolls must be submitted to Owner prior to contract acceptance and final payment. The Contractor shall file
4993 with the Owner an affidavit that he has complied with all requirements of the prevailing wage law. The affidavit
4994 shall accompany or precede the Contractor's request for final payment.
4995

4996 Section 290.250 of reference law requires that the Contractor shall forfeit as a penalty to the Owner \$100,000
4997 dollars for each workman employed, for each calendar day, or portion thereof, such workman is paid less than the
4998 stipulated rates for any work done under said contract, by him or by any Subcontractor under him.
4999

5000 The Contractor's Bond shall include such provisions as will guarantee the faithful performance of the prevailing
5001 hourly wage law.
5002
5003

"General Decision Number: M020210001 01/01/2021

Superseded General Decision Number: M020200001

State: Missouri

Construction Types: Heavy and Highway

Counties: Missouri Statewide.

HEAVY AND HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 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, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021

CARP0002-002 05/01/2019

ST. LOUIS COUNTY AND CITY

	Rates	Fringes
Carpenters.....	\$ 38.02	17.77

CARP0005-006 05/03/2015

CASS (Richards-Gebauer AFB ONLY), CLAY, JACKSON, PLATTE AND RAY COUNTIES

	Rates	Fringes
Carpenters:		
CARPENTERS & LATHERS.....	\$ 36.34	15.55
MILLWRIGHTS & PILEDRIVERS...	\$ 36.34	15.55

CARP0011-001 05/01/2019

	Rates	Fringes
Carpenter and Piledriver		
ADAIR, AUDRAIN (West of Hwy 19), BOONE, CALLAWAY, CHARITON, COLE, COOPER, HOWARD, KNOX, LINN, MACON, MILLER, MONITEAU, MONROE, OSAGE, PUTNAM, RANDOLPH, SCHUYLER, SHELBY AND SULLIVAN COUNTIES.....	\$ 32.28	17.77
ATCHISON, ANDREW, BATES, CALDWELL, CARROLL, DAVIESS, DEKALB, GENTRY, GRUNDY, HARRISON, HENRY, HOLT, LIVINGSTON, MERCER, NODAWAY, ST. CLAIR, SALINE AND WORTH COUNTIES.....	\$ 30.76	17.77
AUDRAIN (East of Hwy.19), RALLS, MARION, LEWIS, CLARK AND SCOTLAND COUNTIES.	\$ 32.29	17.77
BARRY, BARTON, CAMDEN, CEDAR, CHRISTIAN, DADE, DALLAS, DOUGLAS, GREENE, HICKORY, JASPER, LACLEDE, LAWRENCE, MCDONALD, NEWTON, OZARK, POLK, STONE, TANEY, VERNON, WEBSTER AND WRIGHT COUNTIES.	\$ 30.36	17.77
BENTON, MORGAN AND PETTIS...	\$ 30.81	17.77
BOLLINGER, BUTLER, CAPE GIRARDEAU, DUNKLIN, MISSISSIPPI, NEW MADRID, PEMISCOT, PERRY, STE. GENEVIEVE, SCOTT, STODDARD AND WAYNE COUNTIES.....	\$ 32.14	17.77
BUCHANAN, CLINTON, JOHNSON AND LAFAYETTE COUNTIES.....	\$ 31.49	17.77
CARTER, HOWELL, OREGON AND RIPLEY COUNTIES.....	\$ 31.09	17.77
CRAWFORD, DENT, GASCONADE, IRON, MADISON, MARIES, MONTGOMERY, PHELPS, PULASKI, REYNOLDS, SHANNON AND TEXAS COUNTIES.....	\$ 32.13	17.77
FRANKLIN COUNTY.....	\$ 35.56	17.77
JEFFERSON AND ST. CHARLES COUNTIES.....	\$ 38.02	17.77
LINCOLN COUNTY.....	\$ 34.00	17.77
PIKE, ST. FRANCOIS AND		

WASHINGTON COUNTIES.....	\$ 32.92	17.77
WARREN COUNTY.....	\$ 34.44	17.77

ELEC0001-002 05/31/2020

BOLLINGER, BUTLER, CAPE GIRARDEAU, CARTER, DUNKLIN, FRANKLIN,
IRON, JEFFERSON, LINCOLN, MADISON, MISSISSIPPI, NEW MADRID,
PEMISCOT, PERRY, REYNOLDS, RIPLEY, ST. CHARLES, ST. FRANCOIS,
ST. LOUIS (City and County), STE. GENEVIEVE, SCOTT, STODDARD,
WARREN, WASHINGTON AND WAYNE COUNTIES

	Rates	Fringes
Electricians.....	\$ 40.61	27.06

ELEC0002-001 08/01/2020

ADAIR, AUDRAIN, BOONE, CALLAWAY, CAMDEN, CARTER, CHARITON,
CLARK, COLE, COOPER, CRAWFORD, DENT, FRANKLIN, GASCONADE,
HOWARD, HOWELL, IRON, JEFFERSON, KNOX, LEWIS, LINCON, LINN,
MACON, MARIES, MARION, MILLER, MONITEAU, MONROE, MONTGOMERY,
MORGAN, OREGON, OSAGE, PERRY, PHELPS, PIKE, PULASKI, PUTNAM,
RALLS, RANDOLPH, REYNOLDS, RIPLEY, ST. CHARLES, ST. FRANCOIS,
ST. LOUIS (City and County), STE. GENEVIEVE, SCHUYLER,
SCOTLAND, SHANNON, SHELBY, SULLIVAN, TEXAS, WARREN AND
WASHINGTON COUNTIES

	Rates	Fringes
Line Construction:		
Equipment Operator.....	\$ 41.23	21.56
Groundman & Truck Driver....	\$ 31.50	18.01
Lineman & Cable Splicer.....	\$ 48.03	24.03

ELEC0053-004 01/01/2020

	Rates	Fringes
Line Construction: (ANDREW, ATCHINSON, BARRY, BARTON, BUCHANAN, CALDWELL, CEDAR, CHRISTIAN, CLINTON, DADE, DALLAS, DAVIES,, DEKALB, DOUGLAS, GENTRY, GREENE, GRUNDY, HARRISON, HICKORY, HOLT, JASPER, LACLEDE, LAWRENCE, LIVINGSTON, MCDONALD, MERCER, NEWTON, NODAWAY, OZARK, POLK, ST. CLAIR, STONE, TANEY, VERNON, WEBSTER, WORTH AND WRIGHT COUNTIES)		
Groundman Powderman.....	\$ 32.27	16.09
Groundman.....	\$ 30.12	15.38
Lineman Operator.....	\$ 43.40	19.30
Lineman.....	\$ 47.30	20.45

Line Construction; (BATES,
BENTON, CARROLL, CASS, CLAY,
HENRY, JACKSON, JOHNSON,
LAFAYETTE, PETTIS, PLATTE,
RAY AND SALINE COUNTIES)

Groundman Powderman.....	\$ 32.27	15.52
Groundman.....	\$ 30.12	14.88
Lineman Operator.....	\$ 43.40	18.80
Lineman.....	\$ 47.30	19.95

ELEC0095-001 06/01/2019

BARRY, BARTON, CEDAR, DADE, JASPER, LAWRENCE, MCDONALD, NEWTON,
ST CLAIR, AND VERNON COUNTIES

	Rates	Fringes
--	-------	---------

Electricians:

Cable Splicers.....	\$ 25.40	12.19
Electricians.....	\$ 27.43	14.97

ELEC0124-007 08/26/2019

BATES, BENTON, CARROLL, CASS, CLAY, COOPER, HENRY, JACKSON,
JOHNSON, LAFAYETTE, MORGAN, PETTIS, PLATTE, RAY AND SALINE
COUNTIES:

	Rates	Fringes
--	-------	---------

Electricians.....	\$ 40.79	22.92
-------------------	----------	-------

ELEC0257-003 03/01/2020

AUDRAIN (Except Cuivre Township), BOONE, CALLAWAY, CAMDEN,
CHARITON, COLE, CRAWFORD, DENT, GASCONADE, HOWARD, MARIES,
MILLER, MONITEAU, OSAGE, PHELPS AND RANDOLPH COUNTIES

	Rates	Fringes
--	-------	---------

Electricians:

Cable Splicers.....	\$ 30.42	16.085
Electricians.....	\$ 34.00	18.68

ELEC0350-002 12/01/2019

ADAIR, AUDRAIN (East of Highway 19), CLARK, KNOX, LEWIS, LINN,
MACON, MARION, MONROE, MONTGOMERY, PIKE, PUTNAM, RALLS,
SCHUYLER, SCOTLAND, SHELBY AND SULLIVAN COUNTIES

	Rates	Fringes
--	-------	---------

Electricians.....	\$ 32.50	17.65
-------------------	----------	-------

ELEC0453-001 09/01/2020

	Rates	Fringes
Electricians:		
CHRISITAN, DALLAS,		
DOUGLAS, GREENE, HICKORY,		
HOWELL, LACLEDE, OREGON,		
OZARK, POLK, SHANNON,		
WEBSTER and WRIGHT COUNTIES..	\$ 28.10	15.81
PULASKI and TEXAS COUNTIES..	\$ 32.76	16.27
STONE and TANEY COUNTIES....	\$ 23.89	14.99

ELEC0545-003 06/01/2020

ANDREW, BUCHANAN, CLINTON, DEKALB, ATCHISON, HOLT, MERCER,
GENTRY, HARRISON, DAVIESS, GRUNDY, WORTH, LIVINGSTON, NODAWAY,
AND CALDWELL COUNTIES

	Rates	Fringes
Electricians:.....	\$ 33.00	18.10

ELEC0702-004 12/30/2019

BOLLINGER, BUTLER, CAPE GIRARDEAU, DUNKLIN, MADISON,
MISSISSIPPI, NEW MADRID, PEMISCOT, SCOTT, STODDARD AND WAYNE
COUNTIES

	Rates	Fringes
Line Construction:		
Groundman - Class A.....	\$ 30.31	29% + 7.75
Groundman-Equipment		
Operator Class II (all		
other equipment).....	\$ 38.46	29% + 7.75
Heavy-Equipment Operator		
Class I (all crawler type		
equipment D-4 and larger)...	\$ 43.88	29% + 7.75
Lineman.....	\$ 53.51	29% + 7.75

ENGI0101-001 05/01/2020

ANDREW, ATCHISON, BATES, BENTON, BUCHANAN, CALDWELL, CARROLL,
CHARITON, CLINTON, COOPER, DAVIESS, DEKALB, GENTRY, GRUNDY,
HARRISON, HENRY, HOLT, HOWARD, JOHNSON, LAFAYETTE, LINN,
LIVINGSTON, MERCER, NODAWAY, PETTIS, SALINE, SULLIVAN AND WORTH
COUNITIES

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 34.73	18.20
GROUP 2.....	\$ 34.33	18.20
GROUP 3.....	\$ 32.33	18.20

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Asphalt roller operator, finish; asphalt paver and spreader; asphalt plant operator; auto grader or trimmer or sub-grader; backhoe; blade operator (all types); boilers - 2; booster pump on dredge; bulldozer operator; boring machine (truck or crane mounted); clamshell operator; concrete mixer paver; concrete plant operator; concrete pump operator; crane operator; derrick or derrick trucks; ditching machine; dragline operator; dredge engineman; dredge operator; drill cat with compressor mounted (self-contained) or similar type self-propelled rotary drill (not air tract); drilling or boring machine (rotary-self-propelled); finishing machine operator; greaser; high loader-fork lift-skid loader (all types); hoisting engineer (2 active drums); locomotive operator (standard guage); mechanics and welders (field and plants); mucking machine operator; pile drive operator; pitman crane or boom truck (all types); push cat; quad track; scraper operators (all types); shovel operator; sideboom cats; side discharge spreader; skimmer scoop operators; slip form paver operator (CMI, Rex, Gomeco or equal); la tourneau rooter (all tiller types); tow boat operator; truck crane; wood and log chippers (all types).

GROUP 2: A-frame truck operator; articulated dump truck; back filler operator; boilers (1); chip spreader; churn drill operator; compressor; concrete mixer operator, skip loader; concrete saws (self-propelled); conveyor operator; crusher operator; distributor operator; elevating grader operator; farm tractor (all attachments); fireman rig; float operator; form grade operator; hoisting engine (one drum); maintenance operator; multiple compactor; pavement breaker, self-propelled hydra-hammer (or similar type); paymill operator; power shield; pumps; roller operator (with or without blades); screening and washing plant; self-propelled street broom or sweeper; siphons and jets; straw blower; stump cutting machine; siphons and jets; tank car heater operator (combination boiler and booster); welding machine; vibrating machine operator (not hand held); welding machine.

GROUP 3: (a) Oiler;
 (b) Oiler driver
 (c) Mechanic.

HOURLY PREMIUMS:

THE FOLLOWING CLASSIFICATIONS SHALL RECEIVE (\$.25) ABOVE GROUP 1 RATE: Dragline operator - 3 yds. & over; shovel 3 yds. & over; clamshell 3 yds. & over; Crane, rigs or piledrivers, 100' of boom or over (incl. jib.), hoist - each additional active drum over 2 drums

THE FOLLOWING CLASSIFICATIONS SHALL RECEIVE (\$.50) ABOVE GROUP 1 RATE: Tandem scoop operator; crane, rigs or piledrivers 150' to 200' of boom (incl. jib.)

THE FOLLOWING CLASSIFICATIONS SHALL RECEIVE (\$.75) ABOVE

GROUP 1 RATE: Crane rigs, or piledrivers 200 ft. of boom
or over (including jib.)

ENGI0101-005 04/01/2020

CASS, CLAY, JACKSON, PLATTE AND RAY COUNTIES

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 37.02	19.89
GROUP 2.....	\$ 35.98	19.89
GROUP 3.....	\$ 31.51	19.89
GROUP 4.....	\$ 34.86	19.89

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Asphalt roller operator, finish; asphalt paver and spreader; asphalt plant operator; auto grader or trimmer or sub-grader; backhoe; blade operator (all types); boilers-2; booster pump on dredge; boring machine (truck or crane mounted); bulldozer operator; clamshell operator; concrete cleaning decontamination machine operator; concrete mixer paver; concrete plant operator; concrete pump operator; crane operator; derrick or derrick trucks; ditching machine; dragline operator; dredge engineman; dredge operator; drillcat with compressor mounted (self-contained) or similar type self propelled rotary drill (not air tract); drilling or boring machine (rotary - self-propelled); finishing machine operator; greaser; heavy equipment robotics operator/mechanic; horizontal directional drill operator; horizontal directional drill locator; loader-forklift - skid loader (all types); hoisting engineer (2 active drums); locomotive operator (standard guage); master environmental maintenance mechanic; mechanics and welders (field and plants); mucking machine operator; piledrive operator; pitman crane or boom truck (all types); push cat; quad-track; scraper operators (all types); shovel operator; side discharge spreader; sideboom cats; skimmer scoop operator; slip-form paver (CMI, REX, Gomaco or equal); la tourneau rooter (all tiller types); tow boat operator; truck crane; ultra high perssure waterjet cutting tool system operator/mechanic; vacuum blasting machine operator/mechanic; wood and log chippers (all types)

GROUP 2: ""A"" Frame truck operator; back filler operator; boilers (1); chip spreader; churn drill operator; concrete mixer operator, skip loader; concrete saws (self-propelled); conveyor operator; crusher operator; distributor operator; elevating grader operator; farm tractor (all attachments); fireman rig; float operator; form grader operator; hoisting engine (1 drum); maintenance operator; multiple compactor; pavement breaker, self-propelled hydra- hammer (or similar type); power shield; paymill operator; pumps; siphons and jets; stump cutting machine; tank car heater operator (combination

boiler and booster); compressor; roller operator (with or without blades); screening and washing plant; self-propelled street broom or sweeper; straw blower; tank car heater operator (combination boiler and booster); vibrating machine operator (not hand held)

GROUP 3: Oilers

GROUP 4: Oiler Driver (All Types)

FOOTNOTE:

HOURLY PREMIUMS FOLLOWING CLASSIFICATIONS SHALL RECEIVE (\$1.00) ABOVE GROUP 1 RATE:

Clamshells - 3 yd. capacity or over; Cranes or rigs, 80 ft. of boom or over (including jib); Draglines, 3 yd. capacity or over;

Piledrivers 80 ft. of boom or over (including jib);

Shovels & backhoes, 3 yd. capacity or over.

ENGI0101-022 05/01/2019

BARRY, BARTON, CAMDEN, CEDAR, CHRISTIAN, DADE, DALLAS, DOUGLAS, GREENE, HICKORY, JASPER, LACLEDE, LAWRENCE, MCDONALD, NEWTON, OZARK, POLK, ST. CLAIR, STONE, TANEY, VERNON, WEBSTER AND WRIGHT COUNTIES and CITY OF SPRINGFIELD

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 31.72	14.88
GROUP 2.....	\$ 31.37	14.88
GROUP 3.....	\$ 31.17	14.88
GROUP 4.....	\$ 29.12	14.88

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Asphalt finishing machine & trench widening spreader; asphalt plant console operator; autograder; automatic slipform paver; backhoe; blade operator - all types; boat operator - tow; boilers-2; central mix concrete plant operator; clamshell operator; concrete mixer paver; crane operator; derrick or derrick trucks; ditching machine; dozer operator; dragline operator; dredge booster pump; dredge engineman; dredge operator; drill cat with compressor mounted on cat; drilling or boring machine rotary self-propelled; highloader; hoisting engine - 2 active drums; launch hammer wheel; locomotive operator; - standard guage; mechanic and welders; mucking machine; off-road trucks; piledriver operator; pitman crane operator; push cat operator; quad trac; scoop operator - all types; shovel operator; sideboom cats; skimmer scoop operators; trenching machine operator; truck crane.

GROUP 2: A-frame; asphalt hot-mix silo; asphalt plant fireman (drum or boiler); asphalt plant man; asphalt plant man; asphalt plant mixer operator; asphalt roller operator;

backfiller operator; barber-greene loader; boat operator (bridges and dams); chip spreader; concrete mixer operator - skip loader; concrete plant operator; concrete pump operator; crusher operator; dredge oiler; elevating grader operator; fork lift; greaser-fleet; hoisting engine - 1; locomotive operator - narrow gauge; multiple compactor; pavement breaker; powerbroom - self-propelled; power shield; rooter; side discharge concrete spreader; slip form finishing machine; stumpcutter machine; throttle man; tractor operator (over 50 h.p.); winch truck.

GROUP 3: Boilers - 1; chip spreader (front man); churn drill operator; clef plane operator; concrete saw operator (self-propelled); curb finishing machine; distributor operator; finishing machine operator; flex plane operator; float operator; form grader operator; pugmill operator; roller operator, other than high type asphalt; screening & washing plant operator; siphons & jets; sub-grading machine operator; spreader box operator, self-propelled (not asphalt); tank car heater operator (combination boiler & booster); tractor operator (50 h.p. or less); Ulmac, Ulric or similar spreader; vibrating machine operator, not hand;

GROUP 4: Grade checker; Oiler; Oiler-Driver

HOURLY PREMIUMS:

The following classifications shall receive \$.25 above GROUP 1 rate:

Clamshells - 3 yds. or over; Cranes - Rigs or Piledrivers, 100 ft. of boom or over (including jib); Draglines - 3 yds. or over; Hoists - each additional active drum over 2 drums; Shovels - 3 yds. or over;

The following classifications shall receive \$.50 above GROUP 1 rate:

Tandem scoop operator; Cranes - Rigs or Piledrivers, 150 ft. to 200 ft. of boom (including jib); Tandem scoop.

The following classifications shall receive \$.75 above GROUP 1 rate:

Cranes - Rigs or Piledrivers, 200 ft. of boom or over (including jib.).

ENGI0513-004 05/06/2019

FRANKLIN, JEFFERSON, LINCOLN, ST CHARLES, AND WARREN COUNTIES

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 34.36	27.36
GROUP 2.....	\$ 34.36	27.36
GROUP 3.....	\$ 33.06	27.36
GROUP 4.....	\$ 32.61	27.36

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Backhoe, Cable; Backhoe, Hydraulic (2 cu yds bucket and under regardless of attachment, one oiler for 2 or 3, two oilers for 4 through 6); Backhoe, Hydraulic over 2 cu yds; Cableway; Crane, Crawler or Truck; Crane, Hydraulic - Truck or Cruiser mounted, 16 tons and over; Crane, Locomotive; crane with boom including jib over 100 ft from pin to pin; Crane using rock socket tool; Derrick, Steam; Derrick Car and Derrick Boat; Dragline, 7 cu yds and over; Dredge; Gradall, Crawler or tire mounted; Locomotive, Gas, Steam & other powers; Pile Driver, Land or Floating; Scoop, Skimmer; Shovel, Power (Electric, Gas, Steam or other powers); Shovel, Power (7 cu yds and over); Switch Boat; Whirley; Air Tugger with air compressor; Anchor Placing Barge; Asphalt Spreader; Athey Force Feeder Loader, self-propelled; Backfilling Machine; Boat Operator - Push Boat or Tow Boat (job site); Boiler, High Pressure Breaking in Period; Boom Truck, Placing or Erecting; Boring Machine, Footing Foundation; Bullfloat; Cherry Picker; Combination Concrete Hoist and Mixer (such as Mixermobile); Compressor, Two 125 CFM and under; Compressor, Two through Four over 125 CFM; Compressor when operator runs throttle; Concrete Breaker (Truck or Tractor mounted); Concrete Pump (such as Pumpcrete machine); Concrete Saw (self-propelled); Concrete Spreader; Conveyor, Large (not selfpropelled) hoisting or moving brick and concrete into, or into and on floor level, one or both; Crane, Climbing (such as Linden); Crane, Hydraulic - Rough Terrain, self-propelled; Crane, Hydraulic - Truck or Cruiser mounted - under 16 tons; Drilling machine - Self-powered, used for earth or rock drilling or boring (wagon drills and any hand drills obtaining power from other sources including concrete breakers, jackhammers and Barco equipment no engineer required); Elevating Grader; Engine Man, Dredge; Excavator or Powerbelt Machine; Finishing Machine, self-propelled oscillating screed; Forklift; Generators, Two through Six 30 KW or over; Grader, Road with power blade; Greaser; Highlift; Hoist, Concrete and Brick (Brick cages or concrete skips operating or on tower, Towermobile, or similar equipment); Hoist, Three or more drums in use; Hoist, Stack; Hydro-Hammer; Lad-A-Vator, hoisting brick or concrete; Loading Machine such as Barber-Greene; Mechanic on job site

GROUP 2: Air Tugger with plant air; Boiler (for power or heating shell of building or temporary enclosures in connection with construction work); Boiler, Temporary; Compressor, One over 125 CFM; Compressor, truck mounted; Conveyor, Large (not self-propelled); Conveyor, Large (not self-propelled) moving brick and concrete (distributing) on floor level; Curb Finishing Machine; Ditch Paving Machine; Elevator (outside); Endless Chain Hoist; Fireman (as required); Form Grader; Hoist, One Drum regardless of size (except brick or concrete); Lad-A-Vator, other hoisting; Manlift; Mixer, Asphalt, over 8 cu ft capacity; Mixer, one bag capacity or less; Mixer, without side loader, two bag capacity or more; Mixer, with side loader, regardless of size, not Paver; Mud Jack (where mud jack is used in conjunction with an air compressor, operator shall

be paid \$.55 per hour in addition to his basic hourly rate for covering both operations); Pug Mill operator; Pump, Sump - self powered, automatic controlled over 2""; Scissor Lift (used for hoisting); Skid Steer Loader; Sweeper, Street; Tractor, small wheel type 50 HP and under with grader blade and similar equipment; Welding Machine, One over 400 amp; Winch, operating from truck

GROUP 3: Boat operator - outboard motor, job site; Conveyors (such as Con-Vay-It) regardless of how used; Elevator (inside); Heater operator, 2 through 6; Sweeper, Floor

GROUP 4: Crane type

HOURLY PREMIUMS:

Backhoe, Hydraulic 2 cu yds or less without oiler - \$2.00;
Crane, climbing (such as Linden) - \$.50;
Crane, Pile Driving and Extracting - \$.50
Crane with boom (including job) over
100 ft from pin to pin - add \$.01 per foot
to maximum of \$4.00);
Crane, using rock socket tool - \$.50;
Derrick, diesel, gas or electric hoisting material
and erecting steel (150 ft or more above ground) - \$.50;
Dragline, 7 cu yds and over - \$.50;
Hoist, Three or more drums in use - \$.50;
Scoop, Tandem - \$.50;
Shovel, Power - 7 cu yds and over - \$.50;
Tractor, Tandem Crawler - \$.50;
Tunnel, man assigned to work in tunnel or
tunnel shaft - \$.50;
Wrecking, when machines are working on
second floor or higher - \$.50

ENGI0513-006 05/01/2019

ADAIR, AUDRAIN, BOLLINGER, BOONE, BUTLER, CALLAWAY, CAPE
GIRARDEAU, CARTER, CLARK, COLE, CRAWFORD, DENT, DUNKLIN,
GASCONADE, HOWELL, IRON, KNOX, LEWIS, MACON, MADISON, MARIES,
MARION, MILLER, MISSISSIPPI, MONITEAU, MONROE, MONTGOMERY,
MORGAN, NEW MADRID, OREGON, OSAGE, PEMISCOT, PERRY, PHELPS,
PIKE, PULASKI, PUTNAM, RALLS, RANDOLPH, REYNOLDS, RIPLEY, ST.
FRANCOIS, STE. GENEVIEVE, SCHUYLER, SCOTLAND, SCOTT, SHANNON,
SHELBY, STODDARD, TEXAS, WASHINGTON, AND WAYNE COUNTIES

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 29.69	27.16
GROUP 2.....	\$ 29.34	27.16
GROUP 3.....	\$ 29.14	27.16
GROUP 4.....	\$ 25.49	27.16

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Asphalt finishing machine & trench widening spreader, asphalt plant console operator; autograder; automatic slipform paver; back hoe; blade operator - all types; boat operator tow; boiler two; central mix concrete plant operator; clam shell operator; concrete mixer paver; crane operator; derrick or derrick trucks; ditching machine; dozer operator; dragline operator; dredge booster pump; dredge engineman; dredge operator; drill cat with compressor mounted on cat; drilling or boring machine rotary self-propelled; highloader; hoisting engine 2 active drums; launchhammer wheel; locomotive operator standrad guage; mechanics and welders; mucking machine; piledriver operator; pitman crane operator; push cat operator; quad-trac; scoop operator; sideboom cats; skimmer scoop operator; trenching machine operator; truck crane, shovel operator.

GROUP 2: A-Frame; asphalt hot-mix silo; asphalt roller operator asphalt plant fireman (drum or boiler); asphalt plant man; asphalt plant mixer operator; backfiller operator; barber-greene loader; boat operator (bridge & dams); chip spreader; concrete mixer operator skip loader; concrete plant operator; concrete pump operator; dredge oiler; elevating graded operator; fork lift; grease fleet; hoisting engine one; locomotive operator narrow guage; multiple compactor; pavement breaker; powerbroom self-propelled; power shield; rooter; slip-form finishing machine; stumpcutter machine; side discharge concrete spreader; throttleman; tractor operator (over 50 hp); winch truck; asphalt roller operator; crusher operator.

GROUP 3: Spreader box operator, self-propelled not asphalt; tractor operator (50 h.p. or less); boilers one; chip spreader (front man); churn drill operator; compressor over 105 CFM 2-3 pumps 4" & over; 2-3 light plant 7.5 KWA or any combination thereof; clef plane operator; compressor maintenance operator 2 or 3; concrete saw operator (self-propelled); curb finishing machine; distributor operator; finishing machine operator; flex plane operator; float operator; form grader operator; pugmill operator; riller operator other than high type asphalt; screening & washing plant operator; siphons & jets; subgrading machine operator; tank car heater (combination boiler & booster); ulmac, ulric or similar spreader; vibrating machine operator; hydrobroom.

GROUP 4: Oiler; grout machine; oiler driver; compressor over 105 CFM one; conveyor operator one; maintenance operator; pump 4" & over one.

FOOTNOTE: HOURLY PREMIUMS

Backhoe hydraulic, 2 cu. yds. or under Without oiler - \$2.00
Certified Crane Operator - \$1.50;
Certified Hazardous Material Operator \$1.50;
Crane, climbing (such as Linden) - \$0.50;
Crane, pile driving and extracting - \$0.50;
Crane, with boom (including jib) over 100' from pin to pin

add \$0.01 per foot to maximum of \$4.00;
 Crane, using rock socket tool - \$0.50;
 Derrick, diesel, gas or electric, hoisting material and
 erecting steel (150' or more above the ground) - \$0.50;
 Dragline, 7 cu. yds, and over - \$0.50;
 Hoist, three or more drums in use - \$0.50; Scoop, Tandem -
 \$0.50;
 Shovel, power - 7 cu. yds. or more - \$0.50;
 Tractor, tandem crawler - \$0.50;
 Tunnel, man assigned to work in tunnel or tunnel shaft -
 \$0.50;
 Wrecking, when machine is working on second floor or higher -
 \$0.50;

 ENGI0513-007 05/06/2019

ST. LOUIS CITY AND COUNTY

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 34.36	27.36
GROUP 2.....	\$ 34.36	27.36
GROUP 3.....	\$ 33.06	27.36
GROUP 4.....	\$ 32.61	27.36

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Backhoe, cable or hydraulic; cableway; crane
 crawler or truck; crane, hydraulic-truck or cruiser mounted
 16 tons & over; crane locomotive; derrick, steam; derrick
 car & derrick boat; dragline; dredge; gradall, crawler or
 tire mounted; locomotive, gas, steam & other powers; pile
 driver, land or floating; scoop, skimmer; shovel, power
 (steam, gas, electric or other powers); switch boat;
 whirley.

GROUP 2: Air tugger w/air compressor; anchor-placing barge;
 asphalt spreader; atehy force feeder loader (self-
 propelled); backfilling machine; backhoe-loader; boat
 operator-push boat or tow boat (job site); boiler, high
 pressure breaking in period; boom truck, placing or
 erecting; boring machine, footing foundation; bull- float;
 cherry picker; combination concrete hoist & mixer (such as
 mixer mobile); compressor (when operator runs throttle);
 concrete breaker (truck or tractor mounted); concrete pump,
 such as pump-crete machine; concrete saw (self-propelled),
 concrete spreader; conveyor, large (not self-propelled),
 hoisting or moving brick and concrete into, or into and on
 floor level, one or both; crane, hydraulic-rough terrain,
 self-propelled; crane hydraulic-truck or cruiser
 mounted-under 16 tons; drilling machines, self-powered use
 for earth or rock drilling or boring (wagon drills nd any
 hand drills obtaining power from other sources including
 concrete breakers, jackhammers and barco equipment-no
 engineer required); elevating grader; engineman, dredge;
 excavator or powerbelt machine; finishing machine,

self-propelled oscillating screed; forklift; grader, road with power blade; highlift. greaser; hoist, stack, hydro-hammer; loading machine (such as barber-green); machanic, on job site; mixer, pipe wrapping machines; plant asphalt; plant, concrete producing or ready-mix job site; plant heating-job site; plant mixing-job site; plant power, generating-job site; pumps, two through six self-powered over 2""; pumps, electric submersible, two through six, over 4""; quad-track; roller, asphalt, top or sub-grade; scoop, tractor drawn; spreader box; sub-grader; tie tamper; tractor-crawler, or wheel type with or without power unit, power take-offs and attachments regardless of size; trenching machine; tunnel boring machine; vibrating machine automatic, automatic propelled; welding machines (gasoline or diesel) two through six; well drilling machine

GROUP 3: Conveyor, large (not self-propelled); conveyor, large (not self-propelled) moving brick and concrete distributing) on floor level; mixer two or more mixers of one bag capacity or less; air tugger w/plant air; boiler, for power or heating on construction projects; boiler, temporary; compressor (mounted on truck; curb finishing machine; ditch paving machine; elevator; endless chain hoist; form grader; hoist, one drum regardless of size; lad-a-vator; manlift; mixer, asphalt, over 8 cu. ft. capacity, without side loader, 2 bag capacity or more; mixer, with side loader, regardless of size; pug mill operator; pump, sump-self-powered, automatic controlled over 2"" during use in connection with construction work; sweeper, street; welding machine, one over 400 amp.; winch operating from truck; scissor lift (used for hoisting); tractor, small wheel type 50 h.p. & under with grader blade & similar equipment; Oiler on dredge and on truck crane.

GROUP 4: Boat operator-outboard motor (job site); conveyor (such as con-vay-it) regardless of how used; sweeper, floor

HOURLY PREMIUMS:

Backhoe, hydraulic	
2 cu. yds. or under without oiler	\$2.00
Certified Crane Operator	1.50
Certified Hazardous Material Operator	1.50
Crane, climbing (such as Linden)	.50
Crane, pile driving and extracting	.50
Crane, with boom (including jib) over 100' (from pin to pin) add \$.01	
per foot to maximum of	4.00
Crane, using rock socket tool	.50
Derrick, diesel, gas or electric, hoisting material and erecting steel (150' or more above ground)	.50
Dragline, 7 cu. yds. and over	.50
Hoist, three (3) or more drums in use	.50
Scoop, Tandem	.50
Shovel, power - 7 cu. yds. or more	.50
Tractor, tandem crawler	.50
Tunnel, man assigned to work in tunnel or tunnel shaft	.50

Wrecking, when machine is working on
second floor or higher .50

IRON0010-012 04/01/2020

	Rates	Fringes
Ironworkers:		
ANDREW, BARTON, BENTON, CAMDEN, CEDAR, CHARITON, CHRISTIAN, COOPER, DADE, DALLAS, DAVIESS, DE KALB, GENTRY, GREENE, GRUNDY, HARRISON, HICKORY, HOLT, HOWARD, LACLEDE, LINN, LIVINGSTON, MERCER, MONITEAU, MORGAN, NODAWAY, POLK, PUTNAM, RANDLOPH, ST. CLAIR, SULLIVAN, TANEY, VERNON, WEBSTER, WRIGHT and WORTH Counties and portions of ADAIR, BOONE, MACON, MILLER and RANDOLPH Counties.....	\$ 31.00	31.24
ANDREW, BARTON, BENTON, CAMDEN, CEDAR, CHARITON, CHRISTIAN, COOPER, DADE, DALLAS, DAVIESS, DE KALB, GENTRY, GREENE, GRUNDY, HARRISON, HICKORY, HOLT, HOWARD, LACLEDE, LINN, LIVINGSTON, MERCER, MONITEAU, MORGAN, NODAWAY, PETTIS, POLK, PUTNAM, RANDLOPH, ST. CLAIR, SULLIVAN, TANEY, VERNON, WEBSTER, WRIGHT and WORTH Counties and portions of ADAI, BOONE, MACON, MILLER and RANDOLPH Counties.....	\$ 30.55	30.44
ATCHISON, BATES, BUCHANAN, CALDWELL, CARROLL, CASS, CLAY, CLINTON, HENRY, JACKSON, JOHNSON, LAFAYETTE, PETTIS, PLATTE, SALINE, AND RAY COUNTIES....	\$ 34.00	31.24

IRON0321-002 08/01/2020

DOUGLAS, HOWELL and OZARK COUNTIES

	Rates	Fringes
Ironworker.....	\$ 22.00	19.26

IRON0396-004 08/05/2020

ST. LOUIS (City and County), ST. CHARLES, JEFFERSON, IRON, FRANKLIN, LINCOLN, WARREN, WASHINGTON, ST. FRANCOIS, STE. GENEVIEVE, and REYNOLDS Counties; and portions of MADISON, PERRY, BOLLINGER, WAYNE, and CARTER Counties

	Rates	Fringes
Ironworker.....	\$ 35.86	28.11

IRON0396-009 08/05/2020		

AUDRAIN, CALLAWAY, COLE, CRAWFORD, DENT, GASCONADE, MARIES, MONTGOMERY, OSAGE, PHELPS, PIKE, PULASKI, TEXAS and WRIGHT Counties; and portions of BOONE, CAMDEN, DOUGLAS, HOWELL, LACLEDE, MILLER, MONROE, OREGON, SHANNON and RALLS Counties

	Rates	Fringes
Ironworker.....	\$ 31.39	29.20

* IRON0577-005 08/01/2020		

ADAIR, CLARK, KNOX, LEWIS, MACON, MARION, MONROE, RALLS, SCHUYLER, SCOTLAND, AND SHELBY COUNTIES

	Rates	Fringes
Ironworker.....	\$ 27.65	24.20

IRON0584-004 06/01/2019		

BARRY, JASPER, LAWRENCE, MCDONALD, NEWTON AND STONE Counties

	Rates	Fringes
Ironworkers:.....	\$ 26.00	15.35

IRON0782-003 08/01/2020		

CAPE GIRARDEAU, MISSISSIPPI, NEW MADRID, SCOTT, & STODDARD Counties; and portions of BOLLINGER, BUTLER, CARTER, DUNKLIN, MADISON, PEMISCOT, PERRY, RIPLEY, and WAYNE Counties

	Rates	Fringes
Ironworkers:		
Locks, Dams, Bridges and other major work on the Mississippi and Ohio River only.....	\$ 31.63	24.27
All Other Work.....	\$ 28.29	23.77

LAB00042-003 03/04/2020		

ST. LOUIS (City and County)

	Rates	Fringes
LABORER		
Plumber Laborer.....	\$ 34.07	16.07

LAB00042-005 03/04/2020		

ST. LOUIS (City and County)

	Rates	Fringes
LABORER		
Dynamiter, Powderman.....	\$ 34.07	16.07
Laborers, Flaggers.....	\$ 34.07	16.07
Wrecking.....	\$ 34.07	16.07

LAB00424-002 05/01/2020		

	Rates	Fringes
LABORER		
ADAIR, AUDRAIN, BOONE, CALLAWAY, CHARITON, CLARK, COLE, COOPER, HOWARD, IRON, KNOX, LEWIS, LINN, MACON, MADISON, MARION, MILLER, MONITEAU, MONROE, PERRY, PIKE, PUTNAM, RALLS, RANDOLPH, REYNOLDS, ST. FRANCOIS, STE. GENEVIEVE, SCHUYLER, SCOTLAND, SHELBY AND SULLIVAN COUNTIES		
GROUP 1.....	\$ 30.75	14.57
GROUP 2.....	\$ 30.75	14.57
BOLLINGER, BUTLER, CAPE GIRARDEAU, CARTER, CRAWFORD, DENT, DUNKLIN, GASCONADE, HOWELL, MARIES, MISSISSIPPI, NEW MADRID, OREGON, OSAGE, PEMISCOT, PHELPS, PULASKI, RIPLEY, SCOTT, SHANNON, STODDARD, TEXAS, WASHINGTON AND WAYNE COUNTIES		
GROUP 1.....	\$ 30.75	14.57
GROUP 2.....	\$ 30.75	14.57
FRANKLIN COUNTY		
GROUP 1.....	\$ 32.86	14.57
GROUP 2.....	\$ 33.46	14.57
JEFFERSON COUNTY		
GROUP 1.....	\$ 32.91	14.57
GROUP 2.....	\$ 33.51	14.57
LINCOLN, MONTGOMERY AND WARREN COUNTIES		

GROUP 1.....	\$ 34.33	14.57
GROUP 2.....	\$ 34.33	14.57
ST.CHARLES COUNTY		
GROUP 1.....	\$ 34.33	14.57
GROUP 2.....	\$ 34.33	14.57

LABORERS CLASSIFICATIONS

GROUP 1 - General laborer-flagman, carpenter tenders; salamander Tenders; Dump Man; Ticket Takers; loading trucks under bins, hoppers, and conveyors; track man; cement handler; dump man on earth fill; georgie buggy man; material batch hopper man; spreader on asphalt machine; material mixer man (except on manholes); coffer dams; riprap pavers rock, block or brick; scaffolds over ten feet not self-supported from ground up; skip man on concrete paving; wire mesh setters on concrete paving; all work in connection with sewer, water, gas, gasoling, oil, drainage pipe, conduit pipe, tile and duct lines and all other pipe lines; power tool operator; all work in connection with hydraulic or general dredging operations; form setters, puddlers (paving only); straw blower nozzle man; asphalt plant platform man; chuck tender; crusher feeder; men handling creosote ties or creosote materials; men working with and handling epoxy material; topper of standing trees; feeder man on wood pulverizers, board and willow mat weavers and cabelee tiers on river work; deck hands; pile dike and revetment work; all laborers working on underground tunnels less than 25 ft. where compressed air is not used; abutement and pier hole men working six (6) ft. or more below ground; men working in coffer dams for bridge piers and footing in the river; barco tamper; jackson or any other similar tamp; cutting torch man; liners, curb, gutters, ditch lines; hot mastic kettlemen; hot tar applicator; hand blade operator; mortar men or brick or block manholes; rubbing concrete, air tool operator under 65 lbs.; caulker and lead man; chain or concrete saw under 15 h.p.; signal Gan; Guard rail and sign erectors.

GROUP 2 - Skilled laborers - Vibrator man; asphalt raker; head pipe layer on sewer work; batterboard man on pipe and ditch work; cliff scalers working from bosun's chairs; scaffolds or platforms on dams or power plants over 10 ft. high; air tool operator over 65 lbs.; stringline man on concrete paving; sandblast man; laser beam man; wagon drill; churn drill; air track drill and all other similar type drills, gunite nozzle man; pressure grout man; screed man on asphalt; concrete saw 15 h.p. and over; grade checker; strigline man on electronic grade control; manhole builder; dynamite man; powder man; welder; tunnel man; waterblaster - 1000 psi or over; asbestos and/or hazardous waste removal and/or disposal

LAB00579-005 05/01/2020

Rates

Fringes

LABORER (ANDREW, ATCHISON,
BUCHANAN, CALDWELL, CLINTON,
DAVIESS, DEKALB, GENTRY,
GRUNDY, HARRISON, HOLT,
LIVINGSTON, MERCER, NODAWAY
and WORTH COUNTIES.)

GROUP 1.....	\$ 27.21	15.42
GROUP 2.....	\$ 27.56	15.42

LABORER (BARRY, BARTON,
BATES, BENTON, CAMDEN,
CARROLL, CEDAR, CHRISTIAN,
DADE, DALLAS, DOUGLAS,
GREENE, HENRY. HICKORY,
JASPER, JOHNSON, LACLEDE,
LAWRENCE, MCDONALD, MORGAN,
NEWTON, OZARK, PETTIS, POLK,
ST.CLAIR, SALINE, STONE,
TANEY, VERNON, WEBSTER and
WRIGHT COUNTIES)

GROUP 1.....	\$ 26.21	14.62
GROUP 2.....	\$ 26.76	14.62

LABORER (LAFAYETTE COUNTY)

GROUP 1.....	\$ 27.76	14.87
GROUP 2.....	\$ 28.11	14.87

LABORERS CLASSIFICATIONS

GROUP 1: General Laborers - Carpenter tenders; salamander tenders; loading trucks under bins; hoppers & conveyors; track men & all other general laborers; air tool operator; cement handler-bulk or sack; dump man on earth fill; georgie buggy man; material batch hopper man; material mixer man (except on manholes); coffer dams; riprap pavers - rock, block or brick; signal man; scaffolds over ten feet not self-supported from ground up; skipman on concrete paving; wire mesh setters on concrete paving; all work in connection with sewer, water, gas, gasoline, oil drainage pipe, conduit pipe, tile and duct lines and all other pipe lines; power tool operator, all work in connection with hydraulic or general dredging operations; puddlers (paving only); straw blower nozzle man; asphalt plant platform man; chuck tender; crusher feeder; men handling creosote ties or creosote materials; men working with and handling epoxy material or materials (where special protection is required); rubbing concrete; topper of standing trees; batter board man on pipe and ditch work; feeder man on wood pulverizers; board and willow mat weavers and cable tiers on river work; deck hands; pile dike and revetment work; all laborers working on underground tunnels less than 25 feet where compressed air is not used; abutment and pier hole men working six (6) feet or more below ground; men working in coffer dams for bridge piers and footings in the river; ditchliners; pressure groutmen; caulker; chain or concrete saw; cliffscalers working from scaffolds, bosuns' chairs or platforms on dams or power plants over (10) feet above ground; mortarmen on brick or block manholes; toxic and hazardous waste work.

GROUP 2: Skilled Laborers - Head pipe layer on sewer work; laser beam man; Jackson or any other similar tamp; cutting torch man; form setters; liners and stringline men on concrete paving, curb, gutters; hot mastic kettleman; hot tar applicator; sandblasting and gunite nozzlelemen; air tool operator in tunnels; screed man on asphalt machine; asphalt raker; barco tamper; churn drills; air track drills and all similar drills; vibrator man; stringline man for electronic grade control; manhole builders-brick or block; dynamite and powder men; grade checker.

LAB00663-002 04/01/2020

CASS, CLAY, JACKSON, PLATTE AND RAY COUNTIES

	Rates	Fringes
LABORER		
GROUP 1.....	\$ 31.28	16.33
GROUP 2.....	\$ 32.49	16.33

LABORERS CLASSIFICATIONS

GROUP 1: General laborers, Carpenter tenders, salamander tenders, loading trucks under bins, hoppers and conveyors, track men and all other general laborers, air tool operator, cement handler (bulk or sack), chain or concrete saw, deck hands, dump man on earth fill, Georgie Buggies man, material batch hopper man, scale man, material mixer man (except on manholes), coffer dams, abutments and pier hole men working below ground, riprap pavers rock, black or brick, signal man, scaffolds over ten feet not self-supported from ground up, skipman on concrete paving, wire mesh setters on concrete paving, all work in connection with sewer,water, gas, gasoling, oil, drainage pipe, conduit pipe, tile and duct lines and all other pipelines, power tool operator, all work in connection with hydraulic or general dredging operations, straw blower nozzleleman,asphalt plant platform man, chuck tender, crusher feeder, men handling creosote ties on creosote materials, men working with and handling epoxy material or materials (where special protection is required), topper of standing trees, batter board man on pipe and ditch work, feeder man on wood pulverizers, board and willow mat weavers and cable tiers on river work, deck hands, pile dike and revetment work, all laborers working on underground tunnels less than 25 feet where compressed air is not used, abutment and pier hole men working six (6) feet or more below ground, men working in coffer dams for bridge piers and footings in the river, ditchliners, pressure groutmen, caulker and chain or concrete saw, cliffscalers working from scaffolds, bosuns' chairs or platforms on dams or power plants over (10) feet above ground, mortarmen on brick or block manholes, signal man.

GROUP 2: Skilled Laborer - spreader or screed man on

asphalt machine, asphalt raker, grade checker, vibrator man, concrete saw over 5 hp., laser beam man, barco tamper, jackson or any other similar tamp, wagon driller, churn drills, air track drills and other similar drills, cutting torch man, form setters, liners and stringline men on concrete paving, curb, gutters and etc., hot mastic kettleman, hot tar applicator, hand blade operators, mortar men on brick or block manholes, sand blasting and gunnite nozzle men, rubbing concrete, air tool operator in tunnels, head pipe layer on sewer work, manhole builder (brick or block), dynamite and powder men.

PAIN0002-002 09/01/2007

CLARK, FRANKLIN, JEFFERSON, LEWIS, LINCOLN, MARION, PIKE, RALLS, ST. CHARLES, ST. LOUIS (CITY & COUNTY), AND WARREN COUNTIES

	Rates	Fringes
Painters:		
Brush and Roller; Taper.....	\$ 28.61	10.24
High work over 60 feet.....	\$ 29.11	10.24
Lead Abatement.....	\$ 29.36	10.24
Pressure Roller; High work under 60 ft.....	\$ 28.86	10.24
Spray & Abrasive Blasting; Water Blasting (Over 5000 PSI).....	\$ 30.61	10.24
Taper (Ames Tools & Bazooka).....	\$ 30.21	10.24

PAIN0002-006 04/01/2020

ADAIR, AUDRAIN, BOONE, CALLAWAY, CHARITON, COLE, GASCONADE, HOWARD, KNOX, LINN, MACON, MONROE, MONTGOMERY, OSAGE, PUTNAM, RANDOLPH, SCHUYLER, SCOTLAND, SHELBY AND SULLIVAN COUNTIES and the City of Booneville.

	Rates	Fringes
Painters:		
Bridges, Dams, Locks or Powerhouses.....	\$ 26.64	13.98
Brush and Roll; Taping, Paperhanging.....	\$ 24.64	13.98
Epoxy or Any Two Part Coating; Sandblasting; Stage or other Aerial Work - Platforms over 50 feet high; Lead Abatement.....	\$ 25.64	13.98
Spray; Structural Steel (over 50 feet).....	\$ 24.64	13.98
Tapers using Ames or Comparable Tools.....	\$ 25.39	13.98

PAIN0003-004 04/01/2017

CASS, CLAY, CLINTON, JACKSON, JOHNSON, LAFAYETTE, PLATTE & RAY
COUNTIES

	Rates	Fringes
Painters:		
Bridgeman; Lead Abatement; Sandblast; Storage Bin & Tanks.....	\$ 31.96	16.96
Brush & Roller.....	\$ 29.34	16.96
Drywall.....	\$ 30.34	16.96
Paper Hanger.....	\$ 29.84	16.96
Stageman; Beltman; Steelman; Elevator Shaft; Bazooka, Boxes and Power		
Sander; Sprayman; Dipping...	\$ 30.96	16.96
Steeplejack.....	\$ 35.53	16.96

PAIN0003-011 04/01/2011

BATES, BENTON, CALDWELL, CARROLL, COOPER, DAVIESS, GRUNDY,
HARRISON, HENRY, LIVINGSTON, MERCER, MONITEAU, MORGAN, PETTIS &
SALINE COUNTIES

	Rates	Fringes
Painters:		
Bridgeman; Lead Abatement; Sandblast; Storage Bin & Tanks.....	\$ 24.06	14.04
Brush & Roller.....	\$ 22.67	14.04
Drywall.....	\$ 22.84	14.04
Paper Hanger.....	\$ 23.07	14.04
Stageman; Beltman; Steelman; Elevator Shaft; Bazooka, Boxes and Power		
Sander; Sprayman; Dipping...	\$ 23.56	14.04
Steeplejack.....	\$ 26.82	14.04

PAIN0203-001 04/01/2012

BARRY, BARTON, CEDAR, CHRISTIAN, DADE, DALLAS, DOUGLAS, GREENE,
HICKORY, HOWELL, JASPER, LAWRENCE, MCDONALD, NEWTON, OZARK,
POLK, ST. CLAIR, STONE, TANEY, VERNON, WEBSTER, and WRIGHT
COUNTIES

	Rates	Fringes
Painters:		
Finisher.....	\$ 20.18	11.33
Painter.....	\$ 19.75	11.76
Sandblaster, High Man,		

Spray Man, Vinyl Hanger, Tool Operator.....	\$ 21.18	11.33
--	----------	-------

PAIN1265-003 07/01/2013

CAMDEN, CRAWFORD, DENT, LACLEDE, MARIES, MILLER, PHELPS,
PULASKI AND TEXAS COUNTIES

	Rates	Fringes
Painters:		
Brush and Roller.....	\$ 25.64	13.27
Floor Work.....	\$ 26.14	13.27
Lead Abatement.....	\$ 27.89	13.27
Spray.....	\$ 27.14	13.27
Structural Steel, Sandblasting and All Tank Work.....	\$ 26.89	13.27
Taping, Paperhanging.....	\$ 26.64	13.27

PAIN1292-002 09/01/2016

BOLLINGER, BUTLER, CAPE GIRARDEAU, CARTER, DUNKLIN,
MISSISSIPPI, NEW MADRID, OREGON, PEMISCOT, PERRY, REYNOLDS,
RIPLEY, SCOTT, SHANNON, STODDARD and WAYNE COUNTIES

	Rates	Fringes
Painters:		
Bridges, Stacks & Tanks.....	\$ 30.85	11.64
Brush & Roller.....	\$ 25.35	11.64
Spray & Abrasive Blasting; Waterblasting (over 5000 PSI).....	\$ 28.95	11.64

Height Rates (All Areas):
Over 60 ft. \$0.50 per hour.
Under 60 ft. \$0.25 per hour.

PAIN1292-003 09/01/2017

IRON, MADISON, ST. FRANCOIS, STE. GENEVIEVE and WASHINGTON
COUNTIES

	Rates	Fringes
Painters:		
Bridges, Stacks & Tanks.....	\$ 31.05	12.74
Brush & Roller.....	\$ 25.70	12.74
Spray & Abrasive Blasting; Waterblasting (Over 5000 PSI).....	\$ 28.70	12.74

Height Rates (All Areas):

Over 60 ft. \$0.50 per hour
Under 60 ft. \$0.25 per hour.

PAIN2012-001 04/01/2019

ANDREW, ATCHISON, BUCHANAN, DE KALB, GENTRY, HOLT, NODAWAY &
WORTH COUNTIES

	Rates	Fringes
Painters:		
Brush & Roller.....	\$ 31.26	17.26
Sandblaster.....	\$ 32.76	17.26
Steeplejack.....	\$ 36.33	17.26

PLAS0518-006 03/01/2020

BARRY, BARTON, CEDAR, CHRISTIAN, DADE, DALLAS, DOUGLAS, GREENE,
HICKORY, JASPER, LACLEDE, LAWRENCE, MCDONALD, NEWTON, OZARK,
POLK, ST. CLAIR, STONE, TANEY, VERNON, WEBSTER, AND WRIGHT
COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 24.44	12.11

PLAS0518-007 04/01/2020

CASS (Richards-Gebaur AFB only), CLAY, JACKSON, PLATTE AND RAY
COUNTIES

	Rates	Fringes
Cement Masons:.....	\$ 32.72	18.30

PLAS0518-011 04/01/2019

ANDREW, ATCHISON, BATES, BUCHANNAN, CLINTON, DEKALB, GENTRY,
HENRY, HOLT, JOHNSON, LAFAYETTE, NODAWAY & WORTH COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 32.00	20.13

PLAS0527-001 04/01/2018

	Rates	Fringes
CEMENT MASON		
FRANKLIN, LINCOLN AND		
WARREN COUNTIES.....	\$ 30.74	18.07
JEFFERSON, ST. CHARLES		
COUNTIES AND ST. LOUIS		

(City and County).....\$ 32.66 18.62

PLAS0527-004 06/01/2017

CRAWFORD, DENT, IRON, MADISON, MARION, PHELPS, PIKE, PULASKI,
RALLS, REYNOLDS, ST. FRANCOIS, STE. GENEVIEVE, SHANNON, TEXAS,
WASHINGTON COUNTIES

Rates Fringes

CEMENT MASON.....\$ 28.10 18.07

PLAS0908-001 05/01/2017

BOLLINGER, BUTLER, CAPE GIRARDEAU, CARTER, DUNKLIN, HOWELL,
MISSISSIPPI, NEW MADRID, OREGON, PEMISCOT, PERRY, RIPLEY,
SCOTT, STODDARD, AND WAYNE COUNTIES

Rates Fringes

CEMENT MASON.....\$ 27.60 15.73

PLAS0908-005 05/01/2017

BENTON, CALDWELL, CALLAWAY, CAMDEN, CARROLL, COLE, DAVIESS,
GASCONADE, GRUNDY, HARRISON, LIVINGSTON, MACON, MARIES, MERCER,
MILLER, MONTGOMERY, MORGAN, OSAGE, PETTIS & SALINE COUNTIES

Rates Fringes

CEMENT MASON.....\$ 27.60 15.73

PLUM0008-003 06/01/2020

CASS, CLAY, JACKSON, JOHNSON, AND PLATTE COUNTIES

Rates Fringes

Plumbers.....\$ 48.03 22.84

PLUM0008-017 06/01/2020

BATES, BENTON, CARROLL, HENRY, LAFAYETTE, MORGAN, PETTIS, RAY,
ST. CLAIR, SALINE AND VERNON COUNTIES

Rates Fringes

Plumbers.....\$ 48.03 22.84

PLUM0045-003 08/01/2020

ANDREW, ATCHISON, BUCHANAN, CALDWELL, CLINTON, DAVIESS, DEKALB,
GENTRY, HARRISON, HOLT, NODAWAY AND WORTH COUNTIES

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 38.75	24.15

PLUM0178-003 11/01/2020		

BARRY, CEDAR, CHRISTIAN, DADE, DALLAS, DOUGLAS, GREENE,
HICKORY, LACLEDE, LAWRENCE, POLK, STONE, TANEY, WEBSTER AND
WRIGHT COUNTIES

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 32.60	15.12

PLUM0178-006 11/01/2020		

BARTON, JASPER, MCDONALD AND NEWTON COUNTIES

	Rates	Fringes
Plumbers and Pipefitters		
Projects \$750,000 & under...	\$ 29.63	15.22
Projects over \$750,000.....	\$ 32.60	15.12

PLUM0533-004 06/01/2020		

BATES, BENTON, CARROLL, CASS, CLAY, HENRY, HICKORY, JACKSON,
JOHNSON, LAFAYETTE, MORGAN, PETTIS, PLATTE, RAY, SALINE, ST.
CLAIR AND VERNON COUNTIES

	Rates	Fringes
Pipefitters.....	\$ 48.53	22.55

PLUM0562-004 07/01/2020		

ADAIR, AUDRAIN, BOLLINGER, BOONE, BUTLER, CALLAWAY,CAMDEN, CAPE
GIRARDEAU,CARTER, CHARITON, CLARK, COLE, COOPER, CRAWFORD,
DENT, DUNKLIN, FRANKLIN, GASCONADE, GRUNDY, HOWARD, HOWELL,
IRON, JEFFERSON, KNOX, LEWIS, LINCOLN, LINN, LIVINGSTON, MACON,
MADISON, MARIES, MARION, MERCER, MILLER, MISSISSIPPI, MONITEAU,
MONROE, MONTGOMERY, NEW MADRID, OREGON, OSAGE, PEMISCOTT,
PERRY, PHELPS, PIKE, PULASKI, PUTNAM, RALLS, RANDOLPH,
REYNOLDS, RIPLEY, ST. CHARLES, ST.FRANCOIS, STE. GENEVIEVE, ST.
LOUIS, SCHUYLER, SCOTLAND, SCOTT, SHANNON, SHELBY, STODDARD,
SULLIVAN, TEXAS, WARREN, WASHINGTON,AND WAYNE COUNTIES.

	Rates	Fringes
Plumbers and Pipefitters		
Mechanical Contracts		
including all piping and		
temperature control work		
\$7.0 million & under.....	\$ 41.66	21.49

Mechanical Contracts including all piping and temperature control work over \$7.0 million.....	\$ 43.60	27.85
---	----------	-------

PLUM0562-016 07/01/2020

CAMDEN, COLE, CRAWFORD, FRANKLIN, JEFFERSON, MARIES, MILLER,
MONITEAU, OSAGE, PHELPS, PULASKI, ST. CHARLES, ST. LOUIS (City
and County), WARREN and WASHINGTON COUNTIES

	Rates	Fringes
Plumbers		
Mechanical Contracts including all piping and temperature control work \$7.0 million & under.....	\$ 40.41	21.49
Mechanical Contracts including all piping and temperature control work over \$7.0 million.....	\$ 43.60	27.85

TEAM0013-001 05/01/2019

	Rates	Fringes
Truck drivers (ADAIR, BUTLER, CLARK, DUNKIN, HOWELL, KNOX, LEWIS, OREGON, PUTNAM, RIPLEY, SCHUYLER AND SCOTLAND COUNTIES)		
GROUP 1.....	\$ 30.34	13.75
GROUP 2.....	\$ 30.49	13.75
GROUP 3.....	\$ 30.61	13.75
GROUP 4.....	\$ 30.50	13.75

Truck drivers (AUDRAIN, BOLLINGER, BOONE, CALLAWAY, CAPE GIRARDEAU, CARTER, COLE, CRAWFORD, DENT, GASCONADE, IRON, MACON, MADISON, MARIES, MARION, MILLER, MISSISSIPPI, MONROE, MONTGOMERY, NEW MADRID, OSAGE, PEMISCOT, PERRY, PHELPS, PIKE, PULASKI, RALLS, REYNOLDS, ST. FRANCOIS, STE. GENEVIEVE, SCOTT, SHANNON, SHELBY, STODDARD, TEXAS, WASHINGTON AND WAYNE COUNTIES)		
GROUP 1.....	\$ 31.07	13.75
GROUP 2.....	\$ 31.22	13.75
GROUP 3.....	\$ 31.34	13.75
GROUP 4.....	\$ 31.23	13.75

Truck drivers (FRANKLIN,
JEFFERSON and ST. CHARLES
COUNTIES)

GROUP 1.....	\$ 33.43	13.75
GROUP 2.....	\$ 33.58	13.75
GROUP 3.....	\$ 33.65	13.75
GROUP 4.....	\$ 33.54	13.75

Truck drivers (LINCOLN and
WARREN COUNTIES)

GROUP 1.....	\$ 32.08	13.75
GROUP 2.....	\$ 33.23	13.75
GROUP 3.....	\$ 32.30	13.75
GROUP 4.....	\$ 32.19	13.75

TRUCK DRIVERS CLASSIFICATIONS:

GROUP 1: Flat Bed Trucks, Single Axle; Station Wagons;
Pickup Trucks; Material Trucks, Single Axle; Tank Wagon,
Single Axle

GROUP 2: Agitator and Transit Mix Trucks

GROUP 3: Flat Bed Trucks, Tandem Axle; Articulated Dump
Trucks; Material Trucks, Tandem Axle; Tank Wagon, Tandem
Axle

GROUP 4: Semi and/or Pole Trailers; Winch, Fork & Steel
Trucks; Distributor Drivers and Operators; Tank Wagon,
Semi-Trailer; Insley Wagons, Dumpsters, Half-Tracks,
Speedace, Euclids and other similar equipment; A-Frame and
Derrick Trucks; Float or Low Boy

TEAM0056-001 05/01/2020

	Rates	Fringes
Truck drivers (ANDREW, BARTON, BATES, BENTON, CALDWELL, CAMDEN, CARROLL, CEDAR, CHARITON, CHRISTIAN, CLINTON, COOPER, DADE, DALLAS, DAVIESS, DEKALB, DOUGLAS, GREENE, HENRY, HICKORY, HOWARD, JASPER, LACLEDE, LAWRENCE, LINN, LIVINGSTON, MONITEAU, MORGAN, NEWTON, PETTIS, POLK, RANDOLPH, ST. CLAIR, SALINE, VERNON, WEBSTER AND WRIGHT COUNTIES)		
GROUP 1.....	\$ 31.37	14.25
GROUP 2.....	\$ 31.53	14.25
GROUP 3.....	\$ 31.52	14.25
GROUP 4.....	\$ 31.64	14.25
Truck drivers: (ATCHISON, BARRY, GENTRY, GRUNDY, HARRISON, HOLT, MCDONALD, MERCER, NODAWAY, OZARK, STONE, SULLIVAN, TANEY AND WORTH COUNTIES)		

GROUP 1.....	\$ 30.64	14.25
GROUP 2.....	\$ 30.80	14.25
GROUP 3.....	\$ 30.79	14.25
GROUP 4.....	\$ 30.91	14.25

Truck drivers; (BUCHANAN,
JOHNSON AND LAFAYETTE
COUNTIES)

GROUP 1.....	\$ 32.58	14.25
GROUP 2.....	\$ 32.69	14.25
GROUP 3.....	\$ 32.73	14.25
GROUP 4.....	\$ 32.80	14.25

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Flat bed trucks single axle; station wagons; pickup trucks; material trucks single axle; tank wagons single axle.

GROUP 2: Agitator and transit mix-trucks.

GROUP 3: Flat bed trucks tandem axle; articulated dump trucks; material trucks tandem axle; tank wagons tandem axle.

GROUP 4: Semi and/or pole trailers; winch, fork & steel trucks; distributor drivers & operators; tank wagons semi-trailer; insley wagons, dumpsters, half-tracks, speedace, euclids & other similar equipment; A-frames and derrick trucks; float or low boy.

TEAM0245-001 03/26/2012

BARRY, BARTON, CAMDEN, CEDAR, CHRISTIAN, DALLAS, DENT, DOUGLAS, GREENE, HICKORY, HOWELL, JASPER, LACLEDE, LAWRENCE, MCDONALD, MILLER, NEWTON, OZARK, PHELPS, POLK, PULASKI, SHANNON, STONE, TANEY, TEXAS, VERNON, WEBSTER AND WRIGHT COUNTIES

	Rates	Fringes
Truck drivers:		
Traffic Control Service		
Driver.....	\$ 20.45	0.00

PAID HOLIDAYS: New Year's Day, Decoration Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day, employee's birthday and 2 personal days.

TEAM0541-001 04/01/2020

CASS, CLAY, JACKSON, PLATTE AND RAY COUNTIES

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 33.36	16.25

GROUP 2.....	\$ 32.79	16.25
GROUP 3.....	\$ 32.27	16.25

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Mechanics and Welders, Field; A-Frame Low Boy-Boom
ruck Driver.

GROUP 2: Articulated Dump Truck; Insley Wagons: Dump Trucks,
Excavating, 5 cu yds and over; Dumpsters; Half-Tracks:
Speedace: Euclids & similar excavating equipment Material
trucks, Tandem Two teams; Semi-Trailers; Winch trucks-Fork
trucks; Distributor Drivers and Operators; Agitator and
Transit Mix; Tank Wagon Drivers, Tandem or Semi; One Team;
Station Wagons; Pickup Trucks; Material Trucks, Single
Axle; Tank Wagon Drivers, Single Axle

GROUP 3: Oilers and Greasers - Field

TEAM0682-002 05/01/2017

ST LOUIS CITY AND COUNTY

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 33.30	13.79+a+b+c+d
GROUP 2.....	\$ 33.50	13.79+a+b+c+d
GROUP 3.....	\$ 33.60	13.79+a+b+c+d

a. PENSION: 5/1/2012 - \$182.20 per week.

b. HAZMAT PREMIUM: If Hazmat certification on a job site is
required by a state or federal agency or requested by
project owner or by the employer, employees on that job
site shall receive \$1.50 premium pay.

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1 - Pick-up trucks; forklift, single axle; flatbed
trucks; job site ambulance, and trucks or trailers of a
water level capacity of 11.99 cu. yds. or less

GROUP 2 - Trucks or trailers of a water level capacity of
12.0 cu yds. up to 22.0 cu yds. including euclids, speedace
and similar equipment of same capacity and compressors

GROUP 3 - Trucks or trailers of a water level capacity of
22.0 cu. yds & over including euclids, speedace & all
floats, flatbed trailers, boom trucks, winch trucks,
including small trailers, farm wagons tilt-top trailers,
field offices, tool trailers, concrete pumps, concrete
conveyors & gasoline tank trailers and truck mounted mobile
concrete mixers

FOOTNOTE FOR TRUCK DRIVERS:

c. PAID HOLIDAYS: Christmas Day, Independence Day, Labor Day, Memorial Day, Veterans Day, New Years Day, Thanksgiving Day

d. PAID VACATION: 3 days paid vacation for 600 hours of service in any one contract year; 4 days paid vacation for 800 hours of service in any one contract year; 5 days paid vacation for 1,000 hours of service in any one contract year. When such an employee has completed 3 years of continuous employment with the same employer and then works the above required number of hours, he shall receive double the number of days of vacation specified above. When such an employee has completed 10 years of continuous employment with the same employer and then works the above required number of hours, he shall receive triple the number of days of vacation specified above. When such an employee has completed 15 years of continuous employment with the same employer and then works the above required number of hours, he shall receive 4 times the number of days of vacation specified above.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage

determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of 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. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write 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 the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

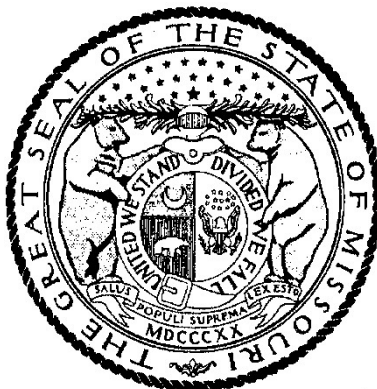
END OF GENERAL DECISION

"

Missouri

Division of Labor Standards

WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

Annual Wage Order No. 27

Section 001
ADAIR COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by

Taylor Burks, Director
Division of Labor Standards

Filed With Secretary of State: March 10, 2020

Last Date Objections May Be Filed: April 9, 2020

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	*\$19.91
Boilermaker	*\$19.91
Bricklayer	\$49.19
Carpenter	\$48.08
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	*\$19.91
Plasterer	
Communications Technician	*\$19.91
Electrician (Inside Wireman)	\$51.92
Electrician Outside Lineman	*\$19.91
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	*\$19.91
Glazier	*\$19.91
Ironworker	*\$19.91
Laborer	*\$19.91
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	*\$19.91
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	*\$19.91
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	*\$19.91
Plumber	\$64.07
Pipe Fitter	
Roofer	\$49.10
Sheet Metal Worker	\$51.12
Sprinkler Fitter	*\$19.91
Truck Driver	*\$19.91
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received less than 1,000 reportable hours for this occupational title.
Public works contracting minimum wage is established for this occupational title using data provided by Missouri
Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

Heavy Construction Rates for
ADAIR County

Section 001

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$58.63
Millwright	
Pile Driver	
Electrician (Outside Lineman)	*\$19.91
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$45.56
General Laborer	
Skilled Laborer	
Operating Engineer	\$58.86
Group I	
Group II	
Group III	
Group IV	
Truck Driver	*\$19.91
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received less than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME and HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, "**overtime work**" shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January First;
The last Monday in May;
July Fourth;
The first Monday in September;
November Eleventh;
The fourth Thursday in November; and
December Twenty-Fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

SECTION 5
TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>
SITEWORK	
P-101	PREPARATION/REMOVAL OF EXISTING PAVEMENTS
P-151	CLEARING AND GRUBBING
P-152	EXCAVATION, SUBGRADE, AND EMBANKMENT
P-153	CONTROLLED LOW-STRENGTH MATERIAL (CLSM)
P-155	LIME-TREATED SUBGRADE
BASE COURSES	
P-209	CRUSHED AGGREGATE BASE COURSE
RIGID PAVEMENT	
P-501	PORTLAND CEMENT CONCRETE PAVEMENT
MISCELLANEOUS	
P-605	JOINT SEALANTS FOR PAVEMENTS
P-620	RUNWAY AND TAXIWAY PAINTING
TURFING	
T-901	SEEDING
LIGHTING INSTALLATION	
L-108	UNDERGROUND POWER CABLE FOR AIRPORTS
L-110	AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUIT
L-115	ELECTRICAL MANHOLES AND JUNCTION STRUCTURES
L-125	INSTALLATION OF AIRPORT LIGHTING SYSTEMS

Intentionally Left Blank

ITEM P-101 PREPARATION/REMOVAL OF EXISTING PAVEMENTS

DESCRIPTION

101-1.1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2.1 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 and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 12-inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompact and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

- b. **Asphalt pavement removal.** Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. Asphalt pavement removal is not required at this airport.
- c. **Repair or removal of Base, Subbase, and/or Subgrade.** All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 PREPARATION OF JOINTS AND CRACKS PRIOR TO OVERLAY/SURFACE TREATMENT. Remove all vegetation and debris from cracks to a minimum depth of 1 inch (25 mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch (6 mm) wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch (3 mm), not to exceed 1/4 inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide (38 mm)), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural Gradation sand without approval in writing from the RPR.

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	90-100
No. 16 (1.18 mm)	65-90
No. 30 (600 µm)	40-60
No. 50 (300 µm)	25-42
No. 100 (150 µm)	15-30
No. 200 (75 µm)	10-20

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches (+0 to -3 mm) of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

101-3.3 REMOVAL OF FOREIGN SUBSTANCES/CONTAMINATES PRIOR TO OVERLAY, SEAL-COAT OR 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.

Chemicals, high-pressure water, heater scarifier (asphaltic concrete only), cold milling, rotary grinding, or sandblasting may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch (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 PRAVEMENT REPAIR.

- a. **Repair of concrete spalls in areas to be overlaid with asphalt.** The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches (50 mm) deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches (100 mm) in depth. This method of repair applies only to pavement to be overlaid.
- b. **Asphalt pavement repair.** The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 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 underlying 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 (2 m) 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 (+0 mm and -6mm) 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 REIGID PAVEMENT PRIOR TO RESEALING. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 REMOVAL OF EXISTING JOINT SEALANT. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch (2 mm) from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 CLEANING PRIOR TO SEALING. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 JOINT SEALANT. Joint material and installation will be in accordance with Item P-605.

101-3.9 PREPARATION OF CRACKS IN FLEXIBLE PAVEMENT PRIOR TO SEALING. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 PREPARATION OF CRACK. Widen crack with router or random crack saw by removing a minimum of 1/16 inch (2 mm) from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 REMOVAL OF EXISTING CRACK SEALANT. Existing sealants will be removed by routing or random crack saw. Following routing or sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 CRACK SEALANT. Crack sealant material and installation will be in accordance with Item P-605.

01-3.9.4 REMOVAL OF PIPE AND OTHER BURIED STRUCTURES.

a. **Removal of Existing Pipe Material.** Not used.

b. **Removal of Inlets/Manholes.** Not used.

METHOD OF MEASUREMENT

101-4.1 PAVEMENT REMOVAL. The unit of measurement for pavement removal shall be the number of square yards (square meters) removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.

101-4.2 JOINT AND CRACK REPAIR. The unit of measurement for joint and crack repair shall be the linear foot (meter) of joint.

101-4.3 REMOVAL OF FOREIGN SUBSTANCES/CONTAMINATES. The unit of measurement for foreign Substances/contaminates removal shall be the square foot (meter).

101-4.4 SPALLED AND FAILED ASPHALT PAVEMENT REPAIR. The unit of measure for failed asphalt pavement repair shall be square foot (square meter).

101-4.5 CONCRETE SPALL REPAIR. The unit of measure for concrete spall repair shall be the number of square feet (square meter). The location and average depth of the patch shall be determined and agreed upon by the RPR and the Contractor.

101-4.6 COLD MILLING. The unit of measure for cold milling shall be inches of milling per square yard (square meter). The location and average depth of the cold milling shall be as shown on the plans. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling.

101-4.7 REMOVAL OF PIPE AND OTHER BURIED STRUCTURES. Not required.

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.

Payment will be made under:

Item P 101a	Pavement Removal - per square yard (square meter)
Item P 101b	Joint and Crack Repair – per linear foot (meter)
Item P-101c	Concrete Spall Repair - per square foot (square meter)

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-151 CLEARING AND GRUBBING

DESCRIPTION

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

- a. **Clearing** shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.
- b. **Clearing and grubbing** shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the RPR is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.
- c. **Tree Removal.** Tree Removal shall consist of the cutting and removal of isolated single trees or isolated groups of trees, and the grubbing of stumps and roots. The removal of all the trees of this classification shall be in accordance with the requirements for the particular area being cleared.

CONSTRUCTION METHODS

151-2.1 GENERAL. The areas denoted on the plans to be cleared and grubbed shall be staked on the ground by the Contractor as indicated on the plans.

The removal of existing structures and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the RPR who will notify the proper local authority or owner to secure prompt action.

151-2.1.1 DISPOSAL. All materials removed by clearing or by clearing and grubbing shall be disposed of in the designated waste disposal area or outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the RPR. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

151-2.1.2 BLASTING. Blasting shall not be allowed.

151-2.2 CLEARING. The Contractor shall clear the staked or indicated area of all materials as indicated on the plans. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from injury all trees not to be

removed. The trees, stumps, and brush shall be cut flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the RPR. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a location designated by the RPR if the fence is to remain the property of a local owner or authority.

151-2.3 CLEARING AND GRUBBING. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials as indicated on the plans, shall be removed, except where embankments exceeding 3-1/2 feet (105 cm) in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and other projections over 1-1/2 inches (38 mm) in diameter shall be grubbed out to a depth of at least 18 inches (0.5 m) below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet (60 cm) below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes in embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

METHOD OF MEASUREMENT

151-3.1 No separate measurement for payment shall be made for clearing and grubbing. Clearing and grubbing shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

151-4.1 No payment will be made separately or directly for clearing and grubbing. Clearing and grubbing shall be considered necessary and incidental to the work of this Contract.

Payment will be made under:

No payment will be made separately or directly for clearing and grubbing. Clearing and grubbing shall be considered necessary and incidental to the work of this Contract.

****END OF ITEM P-151****

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. **Borrow excavation.** Borrow excavation shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from areas designated by the Resident Project Representative (RPR) within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport boundaries.

152-1.3 UNSUITABLE EXCAVATION. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 GENERAL. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) 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.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot (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 cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

- a. **Selective grading.** When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

- b. **Undercutting.** Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (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 of at locations shown on the plans or 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 (per cubic meter) for unclassified 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 (60 cm) 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 within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the RPR. All unsuitable material shall be disposed of by the Contractor as shown on the plans. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

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, or under any areas to be paved, 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 D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 PREPARATION OF EMBANKMENT AREA. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) 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 (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 CONTROL STRIP. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 FORMATION OF EMBANKMENTS. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches (150 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

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 $\pm 2\%$ 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 RPR will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 3,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (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 D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12-inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm) which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938.

The RPR shall perform all density tests. 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 for excavation, borrow, or other items

152-2.9 PROOF ROLLING. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, and after compaction is completed, the subgrade area shall be proof rolled with a 20 ton (18.1 metric ton) Tandem axle Dual Wheel

Dump Truck loaded to the legal limit with tires inflated to 80/100/150 psi (0.551 MPa/0.689 MPa/1.034 MPa) in the presence of the RPR. Apply a minimum of 50% 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 (300 mm) and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 95 percent of the maximum density as determined by ASTM D1557.

The material to be compacted shall be within $\pm 2\%$ 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 $\frac{3}{4}$ inch (19.0 mm) sieve, follow the methods in ASTM D1557. Tests for moisture content and compaction will be taken at a minimum of **500** S.Y. of subgrade. All quality assurance testing shall be done by the RPR.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 FINISHING AND PROTECTION OF SUBGRADE. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 HAUL. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 SURFACE TOLERANCES. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than $\pm \frac{1}{2}$ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within \pm 0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to be placed, grade shall not vary more than 0.10 feet (30 mm) 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, it shall be salvaged from stripping or other grading operations. 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.

METHOD OF MEASUREMENT

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

BASIS OF PAYMENT

152-4.1 Unclassified Material payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152a	Unclassified Excavation - per cubic yard (cubic meter)
-------------	--

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/ft³ (600 kN-m/m³))

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/ft³ (2700 kN-m/m³))

ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2 Operational Safety on Airports During Construction Software

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66 Design and Construction of Airport Pavements on Expansive Soils

****END OF ITEM P-152****

ITEM P-153 CONTROLLED LOW-STRENGTH MATERIAL (CLSM) 3721

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 II.
- 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.

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.

Payment will be made under:

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 D4832 Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders

****END OF ITEM P-153****

ITEM P-155 LIME-TREATED SUBGRADE

DESCRIPTION

155-1.1 This item shall be used for soil modification that require strength gain to a specific level. This item shall consist of constructing one or more courses of a mixture of soil, lime, and water in accordance with this specification, and in conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans.

MATERIALS

155-2.1 LIME. Quicklime, hydrated lime, and either high-calcium dolomitic, or magnesium lime, as defined by ASTM C51, shall conform to the requirements of ASTM C977. Lime not produced from calcining limestone is not permitted.

155-2.2 COMMERCIAL LIME SLURRY. Commercial lime slurry shall be a pumpable suspension of solids in water. The water or liquid portion of the slurry shall not contain dissolved material injurious or objectionable for the intended purpose. The solids portion of the mixture, when considered on the basis of “solids content,” shall consist principally of hydrated lime of a quality and fineness sufficient to meet the following chemical composition and residue requirements.

- a. **Chemical composition.** The “solids content” of the lime slurry shall consist of a minimum of 70%, by weight, of calcium and magnesium oxides.
- b. **Residue.** The percent by weight of residue retained in the “solids content” of lime slurry shall conform to the following requirements:
 - Residue retained on a No. 6 (3.35 µm) sieve = maximum 0.0%
 - Residue retained on a No. 10 (2.00 µm) sieve = maximum 1.0%
 - Residue retained on a No. 30 (600 µm) sieve = maximum 2.5%
- c. **Grade.** Commercial lime slurry shall conform to one of the following two grades:
 - Grade 1. The “dry solids content” shall be at least 31% by weight, of the slurry.
 - Grade 2. The “dry solids content” shall be at least 35%, by weight, of the slurry.

155-2.3 WATER. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

155-2.4 SOIL. The soil for this work shall consist of on-site materials free of roots, sod, weeds, and stones larger than 2-1/2 inches (60 mm) and have a sulfate content of less than 0.3%.

COMPOSITION

155-3.1 SOIL-LIME MIXTURE. Lime shall be applied at 4% dry unit weight of soil for the depth of subgrade treatment as shown on the plans.

155-3.2 TOLERANCES. At final compaction, the lime and water content for each course of subgrade treatment shall conform to the following tolerances:

Tolerances

Material	Tolerance
Lime	+ 0.5%
Water	+ 2%, -0%

WEATHER LIMITATIONS

155-4.1 WEATHER LIMITATION. Subgrade shall not be constructed when weather conditions detrimentally affect the quality of the materials. Lime shall not be applied unless the air temperature is at least 40°F (4°C) and rising. Lime shall not be applied to soils that are frozen or contain frost. Protect completed lime-treated areas by approved methods against the detrimental effects of freezing if the air temperature falls below 35°F (2°C). Remove and replace any damaged portion of the completed soil-lime treated area with new soil-lime material in accordance with this specification.

EQUIPMENT

155-5.1 EQUIPMENT. All equipment necessary to grade, scarify, spread, mix and compact the material shall be provided. The Resident Project Representative (RPR) must approve the Contractor's proposed equipment prior to the start of the treatment.

CONSTRUCTION METHODS

155-6.1 GENERAL. This specification is to construct a subgrade consisting of a uniform lime mixture which shall be free from loose or segregated areas. The subgrade shall be of uniform density and moisture content, well mixed for its full depth, and have a smooth surface suitable for placing subsequent lifts. The Contractor shall be responsible to meet the above requirements.

Prior to any treatment, the subgrade shall be constructed as specified in Item P-152, Excavation, Subgrade and Embankment, and shaped to conform to the typical sections, lines, and grades as shown on the plans.

The mixing equipment must give visible indication at all times that it is cutting, pulverizing and mixing the material uniformly to the proper depth over the full width of the cut.

155-6.2 APPLICATION. Lime shall be uniformly spread only over an area where the initial mixing operations can be completed during the same work day. Lime shall not be applied when wind conditions are detrimental to proper application. A motor grader shall not be used to spread the lime. Adequate moisture shall be added to the cement/soil mixture to maintain the proper moisture content. Materials shall be handled, stored, and applied in accordance with all federal, state, and local requirements.

155-6.3 MIXING. The mixing procedure shall be as described below:

- a. **Preliminary mixing.** The full depth of the treated subgrade shall be mixed with an approved mixing machine. Lime shall not be left exposed for more than six (6) hours. The mixing machine shall make two coverages. Water shall be added to the subgrade during mixing to provide a moisture content approximately 3% to 5% above the optimum moisture of the material and to ensure chemical reaction of the lime and subgrade. After mixing, the subgrade shall be lightly rolled

to seal the surface and help prevent evaporation of moisture. The water content of the subgrade mixture shall be maintained at a moisture content above the optimum moisture content for a minimum of 4 to 24 hours or until the material becomes friable. During the mellowing period, the material shall be sprinkled as directed by the RPR.

- b. **Final mixing.** After the required mellowing time, the material shall be uniformly mixed by approved methods. Any clods shall be reduced in size by blading, discing, harrowing, scarifying, or by the use of other approved pulverization methods. After curing, pulverize lime treated material until 100% of soil particles pass a one-inch (25.0 mm) sieve and 60% pass the No. 4 (4.75 mm) sieve when tested dry by laboratory sieves. If resultant mixture contains clods, reduce their size by scarifying, remixing, or pulverization to meet specified gradation.

155-6.4 CONTROL STRIP. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. Upon acceptance of the control strip by the RPR, the Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

155-6.5 TREATMENT APPLICATION AND DEPTH CHECKS. The depth and amount of stabilization shall be measured by the Contractor with no less than 2 tests per day of material placed; test shall be witnessed by the RPR. Measurements shall be made in test holes excavated to show the full depth of mixing and the pH checked by spraying the side of the test hole with a pH indicator such as phenolphthalein. Phenolphthalein changes from clear to red between pH 8.3 and 10. The color change indicates the location of the bottom of the mixing zone. pH indicators other than phenolphthalein can be used to measure pH levels. If the pH is not at least 8.3 and/or if the depth of the treated subgrade is more than 1/2 inch (12 mm) deficient, additional lime treatment shall be added and the material remixed. The Contractor shall correct all such areas in a manner satisfactory to the RPR.

155-6.6 COMPACTION. Compaction of the mixture shall immediately follow the final mixing operation with the mixture compacted within 1 to 4 hours after final mixing. The material shall be at the moisture content specified in paragraph 155-3.2 during compaction. The field density of the compacted mixture shall be at least 95% of the maximum density as specified in paragraph 155-6.10. Perform in-place density test to determine degree of compaction between 24 and 72 hours after final compaction and the 24-hour moist cure period. If the material fails to meet the density requirements, it shall be reworked to meet the density requirements. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

155-6.7 FINISHING AND CURING. After the final lift or course of lime-treated subgrade has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The completed section shall then be finished by rolling, as directed by the RPR, with a pneumatic or other suitable roller sufficiently light to prevent hairline cracking. The finished surface shall not vary more than 1/2-inch (12 mm) when tested with a 12-foot (3.7 m) straightedge applied parallel with and at right angles to the pavement centerline. Any variations in excess of this tolerance shall be corrected by the Contractor at the Contractor's expense in a manner satisfactory to the RPR.

The completed section shall be moist-cured for a minimum of seven (7) days before further courses are added or any traffic is permitted, unless otherwise directed by the RPR. The final lift should not be exposed for more than 14 days without protection or the placement of a base course material.

155-6.8 MAINTENANCE. The Contractor shall protect and maintain the lime-treated subgrade from yielding until the lime-treated subgrade is covered by placement of the next lift. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meets all specification requirements. The maintenance cost shall be incidental to this item.

155-6.9 SURFACE TOLERANCE. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than $\pm 1/2$ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within ± 0.05 feet (15 mm) of the specified grade.

155-6.10 ACCEPTANCE SAMPLING AND TESTING. The lime treated subgrade shall be accepted for density and thickness on an area basis. Testing frequency shall be a minimum of one compaction and thickness test per 1000 square yards (840 square meters) of lime treated subgrade, but not less than four (4) tests per day of production. Sampling locations will be determined on a random basis per ASTM D3665.

- a. **Density.** All testing shall be done by the Contractor's laboratory in the presence of the RPR and density test results shall be furnished upon completion to the RPR for acceptance determination.

The field density of the compacted mixture shall be at least 95% of the maximum density of laboratory specimens prepared from samples taken from the material in place. The specimens shall be compacted and tested in accordance with ASTM D698 to determine maximum density and optimum moisture content. The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938, Procedure A, direct transmission method. If the material fails to meet the density requirements, the area represented by the failed test shall be reworked to meet the density requirements. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

- b. **Thickness.** The thickness of the course shall be within $\pm 1/2$ 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 (12 mm), the Contractor shall correct such areas at no additional cost. The Contractor shall replace, at his expense, material where depth tests have been taken.

155-6.11 HANDLING AND SAFETY. The Contractor shall obtain and enforce the lime supplier's instructions for proper safety and handling of the lime to prevent physical eye or skin contact with lime during transport or application.

METHOD OF MEASUREMENT

155-7.1 Lime-treated subgrade shall be paid for by the square yard (square meter) in the completed and accepted work.

155-7.2 Lime shall be paid by the number of tons of Hydrated Lime applied at the application rate specified in paragraph 155-3.1.

a. Hydrated lime delivered to the project in dry form will be measured according to the actual tonnage either spread on the subgrade or batched on site into a slurry, whichever is applicable.

b. Quicklime delivered to the project in dry form will be measured for payment on the basis of the tons of equivalent hydrated lime using the following formula:

$$\text{Equivalent Hydrated Lime (Ca(OH)}_2\text{)} = \text{Total Quicklime (CaO)} \times 1.32$$

c. Lime delivered to the project in slurry form will be measure for payment in tons, dry weight of hydrated lime or equivalent hydrated lime in accordance with paragraph b above.

BASIS OF PAYMENT

155-8.1 Payment shall be made at the contract unit price per square yard (square meter) for the lime-treated subgrade at the thickness specified. The price shall be full compensation for furnishing all material, except the lime, and for all preparation, delivering, placing and mixing these materials, and all labor, equipment, tools and incidentals necessary to complete this item.

155-8.2 Payment shall be made at the contract unit price per ton (kg). This price shall be full compensation for furnishing, delivery, and placing this material.

Payment will be made under:

Item P-155a	Lime-treated subgrade - per square yard
Item P-155b	Lime – per ton

REFERENCES

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

ASTM International (ASTM)

ASTM C51	Standard Terminology Relating to Lime and Limestone (as used by the Industry)
ASTM C977	Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

245 ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil
246 Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)
247
248 ASTM D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the
249 Sand-Cone Method
250
251 ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes
252 (Unified Soil Classification System)
253
254 ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and
255 Soil-Aggregate by Nuclear Methods (Shallow Depth)
256
257 Software
258
259 FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design
260
261
262 ****END OF ITEM P-155****
263

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 or 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 or gravel that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face ¹	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles ²	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

¹The 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.

²A 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 (425 µm)	10-30		±5
No. 200 (75 µm)	0-5		±3

¹The "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.

²The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

209-2.3 SAMPLING AND TESTING.

- a. **Aggregate base materials.** The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.
- b. **Gradation requirements.** The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 SEPARATION GEOTEXTILE. Separation geotextile shall be AASHTO M288 Class 2 , 0.02 sec⁻¹ permittivity per ASTM D4491, apparent opening size per ASTM D4751 with 0.60 mm maximum average roll value.

CONSTRUCTION METHODS

209-3.1 CONTROL STRIP. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved by the RPR.

209-3.2 PREPARING UNDERLYING SUBGRADE AND/OR SUBBASE. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 PRODUCTION. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 PLACEMENT. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications at the Contractor's expense.

209-3.5 COMPACTION. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material during placing operations shall be within ± 2 percentage points of the optimum moisture content as

determined by ASTM 1557. 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 (75 mm), reshaped and recompact 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 (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +0 and -1/2 inch (12 mm) of the specified grade.

209-3.9 ACCEPTANCE SAMPLING AND TESTING. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds (1000 m²). Sampling locations will be determined on a random basis per ASTM D3665

- a. **Density.** The RPR shall perform all density tests. 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 D1557. The in-place field density shall be determined per ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompact and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.
- b. **Thickness.** Depth tests shall be made by test holes at least 3 inches (75 mm) in diameter that extend through the base. 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 (12 mm), the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches (75 mm), adding new material of proper gradation, and the material shall be

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

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of cubic yards (cubic meters) 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 shall be measured by the number of square yards of materials placed and accepted by the RPR as complying with the plans and specifications excluding seam overlaps and edge anchoring.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per cubic yard (cubic meter) for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

209-5.2 Payment shall be made at the contract unit price per square yard for separation geotextile. The price shall be full compensation for furnishing all labor, equipment, material, anchors and incidentals necessary.

Payment will be made under:

Item P-209a	Crushed Aggregate Base Course - per cubic yard
Item P-209b	Separation Geotextile Fabric – 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- μ m (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

210	ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
211		
212	ASTM D75	Standard Practice for Sampling Aggregates
213		
214	ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil
215		Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
216		
217	ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the
218		Sand-Cone Method
219		
220	ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil
221		Using Modified Effort (56,000 ft-lbf/ft ³ (2700 kN-m/m ³))
222		
223	ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the
224		Rubber Balloon Method
225		
226	ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine
227		Aggregate
228		
229	ASTM D3665	Standard Practice for Random Sampling of Construction Materials
230		
231	ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index
232		of Soils
233		
234	ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by
235		Permittivity
236		
237	ASTM D4643	Standard Test Method for Determination of Water Content of Soil and
238		Rock by Microwave Oven Heating
239		
240	ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a
241		Geotextile
242		
243	ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and
244		Elongated Particles in Coarse Aggregate
245		
246	ASTM D5821	Standard Test Method for Determining the Percentage of Fractured
247		Particles in Coarse Aggregate
248		
249	ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and
250		Soil-Aggregate by Nuclear Methods (Shallow Depth)
251		
252	ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-
253		Grained Soils Using the Sedimentation (Hydrometer) Analysis
254		

255 American Association of State Highway and Transportation Officials
256 (AASHTO)

257
258 M288 Standard Specification for Geosynthetic Specification for Highway
259 Applications

260

261

262 ****END OF ITEM P-209****

263

264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289

Intentionally Left Blank

ITEM P-501 CEMENT CONCRETE PAVEMENT

DESCRIPTION

501-1.1 This work shall consist of pavement composed of cement concrete with reinforcement and without reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross-sections shown on the plans. The terms cement concrete, hydraulic cement concrete, and concrete are interchangeable in this specification.

MATERIALS

501-2.1 AGGREGATES.

- a. **Reactivity.** Fine and Coarse aggregates to be used in PCC on this project shall be tested and evaluated by the Contractor for alkali-aggregate reactivity in accordance with both ASTM C1260 and ASTM C1567. Tests must be representative of aggregate sources which will be providing material for production. ASTM C1260 and ASTM C1567 tests may be run concurrently.
 - (1) Coarse aggregate and fine aggregate shall be tested separately in accordance with ASTM C1260, however, the length of test shall be extended to 28 days (30 days from casting). Tests must have been completed within 6 months of the date of the concrete mix submittal.
 - (2) The combined coarse and fine aggregate shall be tested in accordance with ASTM C1567, modified for combined aggregates, using the proposed mixture design proportions of aggregates, cementitious materials, and/or specific reactivity reducing chemicals. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.
 - (3) If lithium nitrate is proposed for use with or without supplementary cementitious materials, the aggregates shall be tested in accordance with Corps of Engineers (COE) Concrete Research Division (CRD) C662 in lieu of ASTM C1567. If lithium nitrate admixture is used, it shall be nominal 30% $\pm 0.5\%$ weight lithium nitrate in water. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.
- b. **Fine aggregate.** Grading of the fine aggregate, as delivered to the mixer, shall conform to the requirements of ASTM C33 and the parameters identified in the fine aggregate material requirements below. Fine aggregate material requirements and deleterious limits are shown in the table below.

Fine Aggregate Material Requirements		
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
Sand Equivalent	45 minimum	ASTM D2419
Fineness Modulus (FM)	$2.50 \leq FM \leq 3.40$	ASTM C136
Limits for Deleterious Substances in Fine Aggregate for Concrete		
Clay lumps and friable particles	1.0% maximum	ASTM C142
Coal and lignite	0.5% using a medium with a density of Sp. Gr. of 2.0	ASTM C123
Total Deleterious Material	1.0% maximum	

c. Coarse aggregate. The maximum size coarse aggregate shall be 1-inch.

Aggregates delivered to the mixer shall be clean, hard, uncoated aggregates consisting of crushed stone, crushed or uncrushed gravel, air-cooled iron blast furnace slag, crushed recycled concrete pavement, or a combination. The aggregates shall have no known history of detrimental pavement staining. Steel blast furnace slag shall not be permitted. Coarse aggregate material requirements and deleterious limits are shown in the table below; washing may be required to meet aggregate requirements.

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
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 for any size group coarser than 3/8 (9.5 mm) sieve ¹	ASTM D4791
Bulk density of slag ²	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29
D-cracking (Freeze-Thaw) ³	Durability factor ≥ 95	ASTM C666

¹ 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).

² Only required if slag is specified.

³ 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.

The amount of deleterious material in the coarse aggregate shall not exceed the following limits:

Limits for Deleterious Substances in Coarse Aggregate

Deleterious material	ASTM	Percentage by Mass
Clay Lumps and friable particles	ASTM C142	1.0
Material finer than No. 200 sieve (75 µm)	ASTM C117	1.0 ¹
Lightweight particles	ASTM C123 using a medium with a density of Sp. Gr. of 2.0	0.5
Chert ² (less than 2.40 Sp Gr.)	ASTM C123 using a medium with a density of Sp. Gr. of 2.40)	0.1 ³

¹ The limit for material finer than 75-µm is allowed to be increased to 1.5% for crushed aggregates consisting of dust of fracture that is essentially free from clay or shale. Test results supporting acceptance of increasing limit to 1.5% with statement indicating material is dust of fracture must be submitted with Concrete mix. Acceptable techniques to characterizing these fines include methylene blue adsorption or X-ray diffraction analysis.

² Chert and aggregates with less than 2.4 specific gravity.

³ The limit for chert may be increased to 1.0 percent by mass in areas not subject to severe freeze and thaw.

d. Combined aggregate gradation. This specification is targeted for a combined aggregate gradation developed following the guidance presented in United States Air Force Engineering Technical Letter (ETL) 97-5: Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements. Base the aggregate grading upon a combination of all the aggregates (coarse and fine) to be used for the mixture proportioning. Three aggregate sizes may be required to achieve an optimized combined gradation that will produce a workable concrete mixture for its intended use. Use aggregate gradations that produce concrete mixtures with well-graded or optimized aggregate combinations. The Contractor shall submit complete mixture information necessary to calculate the volumetric components of the mixture. The combined aggregate grading shall meet the following requirements:

(1) The materials selected and the proportions used shall be such that when the Coarseness Factor (CF) and the Workability Factor (WF) are plotted on a diagram as described in paragraph 501-2.1d(4) below, the point thus determined shall fall within the parallelogram described therein.

(2) The CF shall be determined from the following equation:

$$CF = \frac{(\text{cumulative percent retained on the } 3/8 \text{ in. (9.5 mm) sieve})(100)}{(\text{cumulative percent retained on the No. 8 (2.36 mm) sieve})}$$

(3) The WF is defined as the percent passing the No. 8 (2.36 mm) sieve based on the combined gradation. However, WF shall be adjusted, upwards only, by 2.5 percentage points for each 94 pounds (42 kg) of cementitious material per cubic meter yard greater than 564 pounds per cubic yard (335 kg per cubic meter).

(4) A diagram shall be plotted using a rectangular scale with WF on the Y-axis with units from 20 (bottom) to 45 (top), and with CF on the X-axis with units from 80 (left side) to 30 (right side). On this diagram a parallelogram shall be plotted with corners at the following coordinates (CF-75, WF-28), (CF-75, WF-40), (CF-45, WF-32.5), and (CF-45, WF-44.5). If the point determined by the intersection of the computed CF and WF does not fall within the above parallelogram, the grading of each size of aggregate used and the proportions selected shall be changed as necessary. The point determined by the plotting of the CF and WF may be adjusted during production ± 3 WF and ± 5 CF. Adjustments to gradation may not take the point outside of the parallelogram.

- e. **Contractors combined aggregate gradation.** The Contractor shall submit their combined aggregate gradation using the following format:

Contractor's Combined Aggregate Gradation

Sieve Size	Contractor's Concrete mix Gradation (Percent passing by weight)
2 inch (50 mm)	*
1-1/2 inch (37.5 mm)	*
1 inch (25.0 mm)	*
3/4 inch (19.0 mm)	*
1/2 inch (12.5 mm)	*
3/8 inch (9.5 mm)	*
No. 4 (4.75 mm)	*
No. 8 (2.36 mm)	*
No. 16 (1.18 mm)	*
No. 30 (600 μ m)	*
No. 50 (300 μ m)	*
No. 100 (150 μ m)	*

501-2.2 CEMENT. Cement shall conform to the requirements of ASTM C150 Type I or II, or ASTM C595, Type IP (MS)- Low alkali cements shall be utilized, less than 0.6% equivalent alkali for ASTM C150 and the low reactivity option in ASTM C595.

501-2.3 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 alkali content less than 3% per ASTM C311. 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 Resident Project Representative (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.
- c. **Raw or calcined natural pozzolan.** Natural pozzolan shall be raw or calcined and conform to ASTM C618, Class N, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and shall have a loss on ignition not exceeding 6%. Class N pozzolan for use in mitigating Alkali-Silica Reactivity shall have a total available alkali content less than 3%.
- d. **Ultrafine fly ash and ultrafine pozzolan.** UltraFine Fly Ash (UFFA) and UltraFine Pozzolan (UFP) shall conform to ASTM C618, Class F or N, and the following additional requirements:
 - (1) The strength activity index at 28 days of age shall be at least 95% of the control specimens.
 - (2) The average particle size shall not exceed 6 microns.

501-2.4 JOINT SEAL. The joint seal for the joints in the concrete pavement shall meet the requirements of Item P-605 and shall be of the type specified in the plans.

501-2.5 ISOLATION JOINT FILLER. Premolded joint filler for isolation joints shall conform to the requirements of ASTM D1751 and shall be where shown on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the RPR. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the RPR.

501-2.6 STEEL REINFORCEMENT. Reinforcing shall consist of Wire and Welded Wire Reinforcement as shown on the project plans, conforming to the requirements of ASTM A1064.

501-2.7 DOWEL AND TIE BARS. Dowel bars shall be plain steel bars conforming to ASTM A615 and shall be free from burring or other deformation restricting slippage in the concrete.

- a. **Dowel Bars.** Before delivery to the construction site each dowel bar shall be epoxy coated per ASTM A1078, Type 1, with a coating thickness after curing greater than 10 mils. Patched ends are not required for Type 1 coated dowels. The dowels shall be coated with a bond-breaker recommended by the manufacturer. Dowel sleeves or inserts are not permitted. Grout retention rings shall be fully circular metal or plastic devices capable of supporting the dowel until the grout hardens.
- b. **Tie Bars.** Tie bars shall be deformed steel bars and conform to the requirements of ASTM A615. Tie bars designated as Grade 60 in ASTM A615 or ASTM A706 shall be used for construction requiring bent bars.

501-2.8 WATER. Water used in mixing or curing shall be potable. If water is taken from other sources considered non-potable, it shall meet the requirements of ASTM C1602.

501-2.9 MATERIAL FOR CURING CONCRETE. Curing materials shall conform to one of the following specifications:

a. Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C309, Type 2, Class A, or Class B.

b. White polyethylene film for curing concrete shall conform to the requirements of ASTM C171.

c. White burlap-polyethylene sheeting for curing concrete shall conform to the requirements of ASTM C171.

d. Waterproof paper for curing concrete shall conform to the requirements of ASTM C171.

501-2.10 ADMIXTURES. Admixtures shall conform to the following specifications:

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-entraining 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.

c. **Other admixtures.** The use of set retarding and set-accelerating admixtures shall be approved by the RPR prior to developing the concrete mix. Retarding admixtures shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating admixtures shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

d. **Lithium Nitrate.** The lithium admixture shall be a nominal 30% aqueous solution of Lithium Nitrate, with a density of 10 pounds/gallon (1.2 kg/L), and shall have the approximate chemical form as shown below:

Lithium Admixture

Constituent	Limit (Percent by Mass)
LiNO ₃ (Lithium Nitrate)	30 ±0.5
SO ₄ (Sulfate Ion)	0.1 (max)
Cl (Chloride Ion)	0.2 (max)
Na (Sodium Ion)	0.1 (max)
K (Potassium Ion)	0.1 (max)

The lithium nitrate admixture dispensing and mixing operations shall be verified and certified by the lithium manufacturer's representative.

501-2.11 EPOXY-RESIN. All epoxy-resin materials shall be two-component materials conforming to the requirements of ASTM C881, Class as appropriate for each application temperature to be encountered, except that in addition, the materials shall meet the following requirements:

a. Material for use for embedding dowels and anchor bolts shall be Type IV, Grade 3.

- b. Material for use as patching materials for complete filling of spalls and other voids and for use in preparing epoxy resin mortar shall be Type III, Grade as approved.
- c. Material for use for injecting cracks shall be Type IV, Grade 1.
- d. Material for bonding freshly mixed Portland cement concrete or mortar or freshly mixed epoxy resin concrete or mortar to hardened concrete shall be Type V, Grade as approved.

501-2.12 BOND BREAKER. Not required.

CONCRETE MIX

501-3.1. GENERAL. No concrete shall be placed until an acceptable concrete mix has been submitted to the RPR for review and the RPR has taken appropriate action. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

501-3.2 CONCRETE MIX LABORATORY. The laboratory used to develop the concrete mix shall be accredited in accordance with ASTM C1077. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the concrete mix must be included in the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

501-3.3 CONCRETE MIX PROPORTIONS. Develop the mix using the procedures contained in Portland Cement Association (PCA) publication, "Design and Control of Concrete Mixtures." Concrete shall be proportioned to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-6.6 for a flexural strength of 650 psi per ASTM C78.

The minimum cementitious material shall be adequate to ensure a workable, durable mix. The minimum cementitious material (cement plus fly ash, or slag cement) shall be 517 pounds per cubic yard (310 kg per cubic meter). The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall be between 0.38 – 0.45 by weight.

Flexural strength test specimens shall be prepared in accordance with ASTM C192 and tested in accordance with ASTM C78. At the start of the project, the Contractor shall determine an allowable slump as determined by ASTM C143 not to exceed 2 inches (50 mm) for slip-form placement. For fixed-form placement, the slump shall not exceed 3 inches (75 mm). For hand placement, the slump shall not exceed 4 inches (100 mm).

The results of the concrete mix shall include a statement giving the maximum nominal coarse aggregate size and the weights and volumes of each ingredient proportioned on a one cubic yard (meter) basis. Aggregate quantities shall be based on the mass in a saturated surface dry condition.

If a change in source(s) is made, or admixtures added or deleted from the mix, a new concrete mix must be submitted to the RPR for approval.

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.

501-3.4 CONCRETE MIX SUBMITTAL. The concrete mix shall be submitted to the RPR at least 30 days prior to the start of operations. The submitted concrete mix shall not be more than 180 days old and must use the materials to be used for production for the project. Production shall not begin until the concrete mix is approved in writing by the RPR.

Each of the submitted concrete mixes (i.e, slip form, side form machine finish and side form hand finish) shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items and quantities as a minimum:

- Certified material test reports for aggregate in accordance with paragraph 501-2.1. Certified reports must include all tests required; reporting each test, test method, test result, and requirement specified (criteria).
- Combined aggregate gradations and analysis; and including plots of the fine aggregate fineness modulus.
- Reactivity Test Results.
- Coarse aggregate quality test results, including deleterious materials.
- Fine aggregate quality test results, including deleterious materials.
- Mill certificates for cement and supplemental cementitious materials.
- Certified test results for all admixtures, including Lithium Nitrate if applicable.
- Specified flexural strength, slump, and air content.
- Recommended proportions/volumes for proposed mixture and trial water-cementitious materials ratio, including actual slump and air content.
- Flexural and compressive strength summaries and plots, including all individual beam and cylinder breaks.
- Correlation ratios for acceptance testing and Contractor QC testing, when applicable.
- Historical record of test results documenting production standard deviation, when applicable.

501-3.5 CEMENTITIOUS MATERIALS.

- a. **Fly ash.** When fly ash is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If fly ash is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.
- b. **Slag cement (ground granulated blast furnace (GGBF)).** Slag cement may be used. The slag cement, or slag cement plus fly ash if both are used, may constitute between 25 to 55% of the total cementitious material by weight.
- c. **Raw or calcined natural pozzolan.** Natural pozzolan may be used in the concrete mix. When pozzolan is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If pozzolan is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

- d. **Ultrafine fly ash (UFFA) and ultrafine pozzolan (UFP).** UFFA and UFP may be used in the concrete mix with the RPR's approval. When UFFA and UFP is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 7% and 16% by weight of the total cementitious material.

501-3.6 ADMIXTURES.

- a. **Air-entraining admixtures.** Air-entraining admixture are to be added in such a manner that will ensure uniform distribution of the agent throughout the batch. The air content of freshly mixed air-entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the mix shall be 5.0%. Air content shall be determined by testing in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag and other highly porous coarse aggregate.
- b. **Water-reducing admixtures.** Water-reducing admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.
- c. **Other admixtures.** Set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.
- d. **Lithium nitrate.** Lithium nitrate shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements in accordance with paragraph 501-2.10d.

CONSTRUCTION METHODS

501-4.1 CONTROL STRIP. The control strip(s) shall be to the next planned joint after the initial 250 feet (75 m) of each type of pavement construction (slip-form pilot lane, slip-form fill-in lane, or fixed form). The Contractor shall demonstrate, in the presence of the RPR, that the materials, concrete mix, equipment, construction processes, and quality control processes meet the requirements of the specifications. The concrete mixture shall be extruded from the paver meeting the edge slump tolerance and with little or no finishing. Pilot, fill-in, and fixed-form control strips will be accepted separately. Minor adjustments to the mix design may be required to place an acceptable control strip. The production mix will be the adjusted mix design used to place the acceptable control strip. Upon acceptance of the control strip by the RPR, the Contractor must use the same equipment, materials, and construction methods for the remainder of concrete paving. Any adjustments to processes or materials must be approved in advance by the RPR. Acceptable control strips will meet edge slump tolerance and surface acceptable with little or no finishing, air content within action limits, strength equal or greater than requirements of P501-3.3. The control strip will be considered one lot for payment (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 501-8.1 using a lot pay factor equal to 100.

501-4.2 EQUIPMENT. The Contractor is responsible for the proper operation and maintenance of all equipment necessary for handling materials and performing all parts of the work to meet this specification.

- a. **Plant and equipment.** The plant and mixing equipment shall conform to the requirements of ASTM C94 and/or ASTM C685. Each truck mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades. The truck mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch (19 mm) or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

Equipment for transferring and spreading concrete from the transporting equipment to the paving lane in front of the finishing equipment shall be provided. The equipment shall be specially manufactured, self-propelled transfer equipment which will accept the concrete outside the paving lane and will spread it evenly across the paving lane in front of the paver and strike off the surface evenly to a depth which permits the paver to operate efficiently.

- b. **Finishing equipment.**

(1) **Slip-form.** The standard method of constructing concrete pavements shall be with an approved slip-form paving equipment designed and operated to spread, consolidate, screed, and finish the freshly placed concrete in one complete pass of the machine so that the end result is a dense and homogeneous pavement which is achieved with a minimum of hand finishing. The paver-finisher shall be a heavy duty, self-propelled machine designed specifically for paving and finishing high quality concrete pavements.

(2) **Fixed-form.** On projects requiring less than 10,000 cubic yards (7650 cubic meters) of concrete pavement or irregular areas at locations inaccessible to slip-form paving equipment, concrete pavement may be placed with equipment specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR. Hand screeding and float finishing may only be used on small irregular areas as allowed by the RPR.

- c. **Vibrators.** Vibrator shall be the internal type. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation or voids. The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement and meet the recommendations of American Concrete Institute (ACI) 309R, Guide for Consolidation of Concrete. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases. The Contractor shall provide an electronic or mechanical means to monitor vibrator status. The checks on vibrator status shall occur a minimum of two times per day or when requested by the RPR.

Hand held vibrators may only be used in irregular areas and shall meet the recommendations of ACI 309R, Guide for Consolidation of Concrete.

- d. **Concrete saws.** The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

- e. **Fixed forms.** Straight side fixed forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact

and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built-up forms shall not be used, except as approved by the RPR. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the RPR. The forms shall extend the full depth of the pavement section.

501-4.3 FORM SETTING. Forms shall be set to line and grade as shown on the plans, sufficiently in advance of the concrete placement, to ensure continuous paving operation. Forms shall be set to withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the concrete placement.

501-4.4 BASE SURFACE PREPARATION PRIOR TO PLACEMENT. Any damage to the prepared base, subbase, and subgrade shall be corrected full depth by the Contractor prior to concrete placement. The underlying surface shall be entirely free of frost when concrete is placed. The prepared grade shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from concrete.

501-4.5 HANDLING, MEASURING, AND BATCHING MATERIAL. Aggregate stockpiles shall be constructed and managed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Store and maintain all aggregates at a uniform moisture content prior to use. A continuous supply of materials shall be provided to the work to ensure continuous placement.

501-4.6 MIXING CONCRETE. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials are placed into the drum until the drum is emptied into the truck. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C94 or ASTM C685.

Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or non-agitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is discharged from the truck should not exceed 30 minutes when the concrete is hauled in non-agitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. In no case shall the temperature of the concrete when placed exceed 90°F (32°C). Retempering concrete by adding water or by other means will not be permitted. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified is not exceeded.

501-4.7 WEATHER LIMITATIONS ON MIXING AND PLACING. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold weather. Unless authorized in writing by the RPR, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F (4°C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F (2°C).

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50°F (10°C) at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150°F (66°C). The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

Curing during cold weather shall be in accordance with paragraph 501-4.13d.

- b. **Hot weather.** During periods of hot weather when the maximum daily air temperature exceeds 85°F (30°C), the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90°F (32°C). The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The concrete placement shall be protected from exceeding an evaporation rate of 0.2 psf (0.98 kg/m² per hour) per hour. When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. If the Contractor's measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

Curing during hot weather shall be in accordance with paragraph 501-4.13e.

- c. **Temperature management program.** Prior to the start of paving operation for each day of paving, the Contractor shall provide the RPR with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. (Federal Highway Administration HIPERPAV 3 is one example of a temperature management program.) As a minimum, the program shall address the following items:

- (1) Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.
- (2) Anticipated weather conditions such as ambient temperatures, wind velocity, and relative humidity; and anticipated evaporation rate using Figure 19-9, PCA, Design and Control of Concrete Mixtures.
- (3) Anticipated timing of initial sawing of joint.
- (4) Anticipated number and type of saws to be used.

- d. **Rain.** The Contractor shall have available materials for the protection of the concrete during inclement weather. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.8 CONCRETE PLACEMENT. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet (1 m). The finished concrete product must be dense and homogeneous, without segregation and conforming to the standards in this specification. Backhoes and grading equipment shall not be used to distribute the concrete in front of the paver. Front end loaders will not be used. All concrete shall be consolidated without voids or segregation, including under and around all load-transfer devices, joint assembly units, and other features embedded in the pavement. Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a flexural strength of 550 psi (3.8 MPa), based on the average of four field cured specimens per 2,000 cubic yards (1,530 cubic meters) of concrete placed. The Contractor must determine that the above minimum strengths are adequate to protect the pavement from overloads due to the construction equipment proposed for the project.

The Contractor shall have available materials for the protection of the concrete during cold, hot and/or inclement weather in accordance with paragraph 501-4.7.

- a. **Slip-form construction.** The concrete shall be distributed uniformly into final position by a self-propelled slip-form paver without delay. The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose. The paver shall vibrate the concrete for the full width and depth of the strip of pavement being placed and the vibration shall be adequate to provide a consistency of concrete that will stand normal to the surface with sharp well-defined edges. The sliding forms shall be rigidly held together laterally to prevent spreading of the forms. The plastic concrete shall be effectively consolidated by internal vibration with transverse vibrating units for the full width of the pavement and/or a series of equally placed longitudinal vibrating units. The space from the outer edge of the pavement to longitudinal unit shall not exceed 9 inches (23 cm) for slipform and at the end of the dowels for the fill-in lanes. The spacing of internal units shall be uniform and shall not exceed 18 inches (0.5 m).

The term internal vibration means vibrating units located within the specified thickness of pavement section.

The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without, segregation, voids, or vibrator trails and the amplitude of vibration shall be sufficient to be perceptible on the surface of the concrete along the entire length of the vibrating unit and for a distance of at least one foot (30 cm). The frequency of vibration or amplitude should be adjusted proportionately with the rate of travel to result in a uniform density and air content. The paving machine shall be equipped with a tachometer or other suitable device for measuring and indicating the actual frequency of vibrations.

The concrete shall be held at a uniform consistency. The slip-form paver shall be operated with as nearly a continuous forward movement as possible and all operations of mixing, delivering, and spreading concrete shall be coordinated to provide uniform progress with stopping and starting of the paver held to a minimum. If for any reason, it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately. No tractive force shall be applied to the machine, except that which is controlled from the machine.

When concrete is being placed adjacent to an existing pavement, that part of the equipment which is supported on the existing pavement shall be equipped with protective pads on crawler tracks or rubber-tired wheels on which the bearing surface is offset to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

Not more than 15% of the total free edge of each 500-foot (150 m) segment of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch (6 mm), and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch (9 mm). (The total free edge of 500 feet (150 m) of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; that is, 500 feet (150 m) of paving lane originally constructed as a separate lane will have 1,000 feet (300 m) of free edge, 500 feet (150 m) of fill-in lane will have no free edge, etc.). The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches (0.5 m) from the edge.

When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump will be removed the full width of the slip form lane and replaced at the expense of the Contractor as directed by the RPR.

- b. Fixed-form construction.** Forms shall be drilled in advance of being placed to line and grade to accommodate tie bars / dowel bars where these are specified.

Immediately in advance of placing concrete and after all subbase operations are completed, side forms shall be trued and maintained to the required line and grade for a distance sufficient to prevent delay in placing.

Side forms shall remain in place at least 12 hours after the concrete has been placed, and in all cases until the edge of the pavement no longer requires the protection of the forms. Curing compound shall be applied to the concrete immediately after the forms have been removed.

Side forms shall be thoroughly cleaned and coated with a release agent each time they are used and before concrete is placed against them.

Concrete shall be spread, screed, shaped and consolidated by one or more self-propelled machines. These machines shall uniformly distribute and consolidate concrete without segregation so that the completed pavement will conform to the required cross-section with a minimum of handwork.

The number and capacity of machines furnished shall be adequate to perform the work required at a rate equal to that of concrete delivery. The equipment must be specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR.

Concrete for the full paving width shall be effectively consolidated by internal vibrators. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation, voids, or leaving vibrator trails.

Power to vibrators shall be connected so that vibration ceases when forward or backward motion of the machine is stopped.

- c. Consolidation.** Concrete shall be consolidated with the specified type of lane-spanning, gang-mounted, mechanical, immersion type vibrating equipment mounted in front of the paver, supplemented, in rare instances as specified, by hand-operated vibrators. The vibrators shall be inserted into the concrete to a depth that will provide the best full-depth consolidation but not closer to the underlying material than 2 inches (50 mm). Vibrators shall not be used to transport or spread the concrete. For each paving train, at least one additional vibrator spud, or sufficient parts for rapid replacement and repair of vibrators shall be maintained at the paving site at all times. Any evidence of inadequate consolidation (honeycomb along the edges, large air pockets,

or any other evidence) or over-consolidation (vibrator trails, segregation, or any other evidence) shall require the immediate stopping of the paving operation and adjustment of the equipment or procedures as approved by the RPR.

If a lack of consolidation of the hardened concrete is suspected by the RPR, referee testing may be required. Referee testing of hardened concrete will be performed by the RPR by cutting cores from the finished pavement after a minimum of 24 hours curing. The RPR shall visually examine the cores for evidence of lack of consolidation. Density determinations will be made by the RPR based on the water content of the core as taken. ASTM C642 shall be used for the determination of core density in the saturated-surface dry condition. When required, referee cores will be taken at the minimum rate of one for each 500 cubic yards (382 m³) of pavement, or fraction. The Contractor shall be responsible for all referee testing cost if they fail to meet the required density.

The average density of the cores shall be at least 97% of the original concrete mix density, with no cores having a density of less than 96% of the original concrete mix density. Failure to meet the referee tests will be considered evidence that the minimum requirements for vibration are inadequate for the job conditions. Additional vibrating units or other means of increasing the effect of vibration shall be employed so that the density of the hardened concrete conforms to the above requirements.

501-4.9 STRIKE-OFF OF CONCRETE AND PLACEMENT OF REINFORCEMENT. Following the placing of the concrete, it shall be struck off to conform to the cross-section shown on the plans and to an elevation that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screed. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 JOINTS. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2-inch (12 mm) from their designated position and shall be true to line with not more than 1/4-inch (6 mm) variation in 10 feet (3 m). The surface across the joints shall be tested with a 12-foot (3 m) straightedge as the joints are finished and any irregularities in excess of 1/4 inch (6 mm) shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

- a. **Construction.** Longitudinal construction joints shall be slip-formed or formed against side forms as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The

installation of the joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

- b. **Contraction.** Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans.
- c. **Isolation (expansion).** Isolation joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint. The filler shall be fastened uniformly along the hardened joint face with no buckling or debris between the filler and the concrete interface, including a temporary filler for the sealant reservoir at the top of the slab. The edges of the joint shall be finished and tooled while the concrete is still plastic
- d. **Dowels and Tie Bars for Joints**
- (1) **Tie bars.** Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth and within the tolerances in paragraph 501-4.10(f). When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. Tie bars shall not be painted, greased, or enclosed in sleeves. When slip-form operations call for tie bars, two-piece hook bolts can be installed.
- (2) **Dowel bars.** Dowel bars shall be placed across joints in the proper horizontal and vertical alignment as shown on the plans. The dowels shall be coated with a bond-breaker or other lubricant recommended by the manufacturer and approved by the RPR. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.
- (3) **Placing dowels and tie bars.** Horizontal spacing of dowels shall be within a tolerance of $\pm 3/4$ inch (19 mm). The vertical location on the face of the slab shall be within a tolerance of $\pm 1/2$ inch (12 mm). The method used to install dowels shall ensure that the horizontal and vertical alignment will not be greater than 1/4 inch per feet (6 mm per 0.3 m), except for those across the crown or other grade change joints. Dowels across crowns and other joints at grade changes shall be measured to a level surface. Horizontal alignment shall be checked perpendicular to the joint edge. The portion of each dowel intended to move within the concrete or expansion cap shall be wiped clean and coated with a thin, even film of lubricating oil or light grease before the concrete is placed. Dowels shall be installed as specified in the following subparagraphs.
- Dowel bars and tie bars shall not be placed closer than 0.6 times the dowel bar or tie bar length to the planned joint line. If the last regularly spaced longitudinal dowel and/or tie bar is closer than that dimension, it shall be moved away from the joint to a location 0.6

times the dowel bar and/or tie bar length, but not closer than 6 inches (150 mm) to its nearest neighbor.

- (a) **Contraction joints.** Dowels and tie bars in longitudinal and transverse contraction joints within the paving lane shall be held securely in place by means of rigid metal frames or basket assemblies of an approved type. The basket assemblies shall be held securely in the proper location by means of suitable pins or anchors. Do not cut or crimp the dowel basket tie wires.

At the Contractor's option, dowels and tie bars in contraction joints may be installed by insertion into the plastic concrete using approved equipment and procedures per the paver manufacturer's design. Approval of installation methods will be based on the results of the control strip showing that the dowels and tie bars are installed within specified tolerances as verified by cores or non-destructive rebar location devices approved by the RPR.

- (b) **Construction joints.** Install dowels and tie bars by the cast-in-place or the drill-and-dowel method. Installation by removing and replacing in preformed holes will not be permitted. Dowels and tie bars shall be prepared and placed across joints where indicated, correctly aligned, and securely held in the proper horizontal and vertical position during placing and finishing operations, by means of devices fastened to the forms.

- (c) **Joints in hardened concrete.** Install dowels in hardened concrete by bonding the dowels into holes drilled into the concrete. The concrete shall have cured for seven (7) days or reached a minimum flexural strength of 450 psi (3.1 MPa) before drilling begins. Holes 1/8 inch (3 mm) greater in diameter than the dowels shall be drilled into the hardened concrete using rotary-core drills. Rotary-percussion drills may be used, provided that excessive spalling does not occur. Spalling beyond the limits of the grout retention ring will require modification of the equipment and operation. Depth of dowel hole shall be within a tolerance of $\pm 1/2$ inch (12 mm) of the dimension shown on the drawings. On completion of the drilling operation, the dowel hole shall be blown out with oil-free, compressed air. Dowels shall be bonded in the drilled holes using epoxy resin. Epoxy resin shall be injected at the back of the hole before installing the dowel and extruded to the collar during insertion of the dowel so as to completely fill the void around the dowel. Application by buttering the dowel will not be permitted. The dowels shall be held in alignment at the collar of the hole by means of a suitable metal or plastic grout retention ring fitted around the dowel.

- e. **Sawing of joints.** Sawing shall commence, without regard to day or night, as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of the pavement occurs and shall continue without interruption until all joints have been sawn. All slurry and debris produced in the sawing of joints shall be removed by vacuuming and washing. Curing compound or system shall be reapplied in the initial saw-cut and maintained for the remaining cure period.

Joints shall be cut in locations as shown on the plans. The initial joint cut shall be a minimum 1/8 inch (3 mm) wide and to the depth shown on the plans. Prior to placement of joint sealant or seals, the top of the joint shall be widened by sawing as shown on the plans.

501-4.11 FINISHING. Finishing operations shall be a continuing part of placing operations starting immediately behind the strike-off of the paver. Initial finishing shall be provided by the transverse screed or extrusion plate. The sequence of operations shall be transverse finishing, longitudinal machine floating if used, straightedge finishing, edging of joints, and then texturing. Finishing shall be by the machine method. The hand method shall be used only on isolated areas of odd slab widths or shapes and in the event of a breakdown of the mechanical finishing equipment. Supplemental hand finishing for machine finished pavement shall be kept to an absolute minimum. Any machine finishing operation which requires appreciable hand finishing, other than a moderate amount of straightedge finishing, shall be immediately stopped and proper adjustments made or the equipment replaced. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Compensation shall be made for surging behind the screeds or extrusion plate and settlement during hardening and care shall be taken to ensure that paving and finishing machines are properly adjusted so that the finished surface of the concrete (not just the cutting edges of the screeds) will be at the required line and grade. Finishing equipment and tools shall be maintained clean and in an approved condition. At no time shall water be added to the surface of the slab with the finishing equipment or tools, or in any other way. Fog (mist) sprays or other surface applied finishing aids specified to prevent plastic shrinkage cracking, approved by the RPR, may be used in accordance with the manufacturer's requirements.

- a. **Machine finishing with slipform pavers.** The slipform paver shall be operated so that only a very minimum of additional finishing work is required to produce pavement surfaces and edges meeting the specified tolerances. Any equipment or procedure that fails to meet these specified requirements shall immediately be replaced or modified as necessary. A self-propelled non-rotating pipe float may be used while the concrete is still plastic, to remove minor irregularities and score marks. Only one pass of the pipe float shall be allowed. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Remove excessive slurry from the surface with a cutting straightedge and wipe off the edge. Any slurry which does run down the vertical edges shall be immediately removed by hand, using stiff brushes or scrapers. No slurry, concrete or concrete mortar shall be used to build up along the edges of the pavement to compensate for excessive edge slump, either while the concrete is plastic or after it hardens.
- b. **Machine finishing with fixed forms.** The machine shall be designed to straddle the forms and shall be operated to screed and consolidate the concrete. Machines that cause displacement of the forms shall be replaced. The machine shall make only one pass over each area of pavement. If the equipment and procedures do not produce a surface of uniform texture, true to grade, in one pass, the operation shall be immediately stopped and the equipment, mixture, and procedures adjusted as necessary.
- c. **Other types of finishing equipment.** Clary screeds, other rotating tube floats, or bridge deck finishers are not allowed on mainline paving, but may be allowed on irregular or odd-shaped slabs, and near buildings or trench drains, subject to the RPR's approval.

Bridge deck finishers shall have a minimum operating weight of 7500 pounds (3400 kg) and shall have a transversely operating carriage containing a knock-down auger and a minimum of two immersion vibrators. Vibrating screeds or pans shall be used only for isolated slabs where hand finishing is permitted as specified, and only where specifically approved.
- d. **Hand finishing.** Hand finishing methods will not be permitted, except under the following conditions: (1) in the event of breakdown of the mechanical equipment, hand methods may be

used to finish the concrete already deposited on the grade and (2) in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical.

- e. **Straightedge testing and surface correction.** After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a 12-foot (3.7-m) finishing straightedge swung from handles capable of spanning at least one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross-section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 SURFACE TEXTURE. The surface of the pavement shall be finished as designated below for all newly constructed concrete pavements. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. The texture shall be uniform in appearance and approximately 1/16 inch (2 mm) in depth. Any imperfections resulting from the texturing operation shall be corrected to the satisfaction of the RPR.

- a. **Brush or broom finish.** Shall be applied when the water sheen has practically disappeared. The equipment shall operate transversely across the pavement surface.
- b. **Burlap drag finish.** Burlap, at least 15 ounces per square yard (555 grams per square meter), will typically produce acceptable texture. To obtain a textured surface, the transverse threads of the burlap shall be removed approximately one foot (30 cm) from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface.
- c. **Artificial turf finish.** Not used.

501-4.13 CURING. Immediately after finishing operations are completed and bleed water is gone from the surface, all exposed surfaces of the newly placed concrete shall be cured for a 7-day cure period in accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

When a two-saw-cut method is used to construct the contraction joint, the curing compound shall be applied to the saw-cut immediately after the initial cut has been made. The sealant reservoir shall not be sawed until after the curing period has been completed. When the one cut method is used to construct the contraction joint, the joint shall be cured with wet rope, wet rags, or wet blankets. The rags, ropes, or blankets shall be kept moist for the duration of the curing period.

- a. **Impervious membrane method.** Curing with liquid membrane compounds should not occur until bleed and surface moisture has evaporated. All exposed surfaces of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the

surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of one gallon (4 liters) to not more than 150 square feet (14 sq m). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application, the compound shall be stirred continuously by mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. When hand spraying is approved by the RPR, a double application rate shall be used to ensure coverage. Should the film become damaged from any cause, including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

- b. **White burlap-polyethylene sheets.** The surface of the pavement shall be entirely covered with the sheeting. The sheeting used shall be such length (or width) that it will extend at least twice the thickness of the pavement beyond the edges of the slab. The sheeting shall be placed so that the entire surface and both edges of the slab are completely covered. The sheeting shall be placed and weighted to remain in contact with the surface covered, and the covering shall be maintained fully saturated and in position for seven (7) days after the concrete has been placed.
- c. **Water method.** The entire area shall be covered with burlap or other water absorbing material. The material shall be of sufficient thickness to retain water for adequate curing without excessive runoff. The material shall be kept wet at all times and maintained for seven (7) days. When the forms are stripped, the vertical walls shall also be kept moist. It shall be the responsibility of the Contractor to prevent ponding of the curing water on the subbase.
- d. **Concrete protection for cold weather.** Maintain the concrete at a temperature of at least 50°F (10°C) for a period of 72 hours after placing and at a temperature above freezing for the remainder of the 7-day curing period. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather; and any concrete damaged shall be removed and replaced at the Contractor's expense.
- e. **Concrete protection for hot weather.** Concrete should be continuous moisture cured for the entire curing period and shall commence as soon as the surfaces are finished and continue for at least 24 hours. However, if moisture curing is not practical beyond 24 hours, the concrete surface shall be protected from drying with application of a liquid membrane-forming curing compound while the surfaces are still damp. Other curing methods may be approved by the RPR.

501-4.14 REMOVING FORMS. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured in accordance with paragraph 501-4.13.

If honeycombed areas are evident when the forms are removed, materials, placement, and consolidation methods must be reviewed and appropriate adjustments made to assure adequate consolidation at the edges of future concrete placements. Honeycombed areas that extend into the slab less than approximately 1 inch (25 mm), shall be repaired with an approved grout, as directed by the RPR. Honeycombed areas that extend into the slab greater than a depth of 1 inch (25 mm) shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-4.19.

501-4.15 SAW-CUT GROOVING. If shown on the plans, grooved surfaces shall be provided in accordance with the requirements of Item P-621.

501-4.16 SEALING JOINTS. The joints in the pavement shall be sealed in accordance with Item P-605.

501-4.17 PROTECTION OF PAVEMENT. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents until accepted by the RPR. This shall include watchmen to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense.

Aggregates, rubble, or other similar construction materials shall not be placed on airfield pavements. Traffic shall be excluded from the new pavement by erecting and maintaining barricades and signs until the concrete is at least seven (7) days old, or for a longer period if directed by the RPR.

In paving intermediate lanes between newly paved pilot lanes, operation of the hauling and paving equipment will be permitted on the new pavement after the pavement has been cured for seven (7) days, the joints are protected, the concrete has attained a minimum field cured flexural strength of 450 psi (3100 kPa), and the slab edge is protected.

All new and existing pavement carrying construction traffic or equipment shall be kept clean and spillage of concrete and other materials shall be cleaned up immediately.

Damaged pavements shall be removed and replaced at the Contractor's expense. Slabs shall be removed to the full depth, width, and length of the slab.

501-4.18 OPENING TO CONSTRUCTION TRAFFIC. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C31 have attained a flexural strength of 450 pounds per square inch (3100 kPa) when tested in accordance with ASTM C78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction traffic, all joints shall either be sealed or protected from damage to the joint edge and intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

501-4.19 REPAIR, REMOVAL, OR REPLACEMENT OF SLABS. New pavement slabs that are broken or contain cracks or are otherwise defective or unacceptable as defined by acceptance criteria in paragraph 501-6.6 shall be removed and replaced or repaired, as directed by the RPR, at the Contractor's expense. Spalls along joints shall be repaired as specified. Removal of partial slabs is not permitted. Removal and replacement shall be full depth, shall be full width of the slab, and the limit of removal shall be normal to the paving lane and to each original transverse joint. The RPR will determine whether cracks extend full depth of the pavement and may require cores to be drilled on the crack to determine depth of cracking. Such cores shall be have a diameter of 2 inches (50 mm) to 4 inches (100 mm), shall be drilled by the Contractor and shall be filled by the Contractor with a well consolidated concrete mixture bonded to the walls of the hole with a bonding agent, using approved procedures. Drilling of cores and refilling holes shall be at no expense to the Owner. Repair of cracks as described in this section shall not be allowed if in the opinion of the RPR the overall condition of the pavement indicates that such repair is unlikely to achieve an acceptable and durable finished pavement. No repair of cracks shall be allowed in any panel that demonstrates segregated aggregate with an absence of coarse aggregate in the upper 1/8 inch (3 mm) of the pavement surface.

- a. **Shrinkage cracks.** Shrinkage cracks which do not exceed one-third of the pavement depth shall be cleaned and either high molecular weight methacrylate (HMWM) applied; or epoxy resin

(Type IV, Grade 1) pressure injected using procedures recommended by the manufacturer and approved by the RPR. Sandblasting of the surface may be required following the application of HMWM to restore skid resistance. Care shall be taken to ensure that the crack is not widened during epoxy resin injection. All epoxy resin injection shall take place in the presence of the RPR. Shrinkage cracks which exceed one-third the pavement depth shall be treated as full depth cracks in accordance with paragraphs 501-4.19b and 501-19c.

b. Slabs with cracks through interior areas. Interior area is defined as that area more than 6 inches (150 mm) from either adjacent original transverse joint. The full slab shall be removed and replaced at no cost to the Owner, when there are any full depth cracks, or cracks greater than one-third the pavement depth, that extend into the interior area.

c. Cracks close to and parallel to joints. All full-depth cracks within 6 inches (150 mm) either side of the joint and essentially parallel to the original joints, shall be treated as follows.

(1) Full depth cracks and original joint not cracked. The full-depth crack shall be treated as the new joint and the original joint filled with an epoxy resin.

i. Full-depth crack. The joint sealant reservoir for the crack shall be formed by sawing to a depth of 3/4 inches (19 mm), $\pm 1/16$ inch (2 mm), and to a width of 5/8 inch (16 mm), $\pm 1/8$ inch (3 mm). The crack shall be sawed with equipment specially designed to follow random cracks. Any equipment or procedure which causes raveling or spalling along the crack shall be modified or replaced to prevent raveling or spalling. The joint shall be sealed with sealant in accordance with P-605 or as directed by the RPR.

ii. Original joint. If the original joint sealant reservoir has been sawed out, the reservoir and as much of the lower saw cut as possible shall be filled with epoxy resin, Type IV, Grade 2, thoroughly tooled into the void using approved procedures.

If only the original narrow saw cut has been made, it shall be cleaned and pressure injected with epoxy resin, Type IV, Grade 1, using approved procedures.

Where a parallel crack goes part way across paving lane and then intersects and follows the original joint which is cracked only for the remained of the width, it shall be treated as specified above for a parallel crack, and the cracked original joint shall be prepared and sealed as originally designed.

(2) Full depth cracks and original joint cracked. If there is any place in the lane width where a parallel crack and a cracked portion of the original joint overlap, the entire slab containing the crack shall be removed and replaced.

d. Removal and replacement of full slabs. Make a full depth cut perpendicular to the slab surface along all edges of the slab with a concrete saw cutting any dowels or tie-bars. Remove damaged slab protecting adjacent pavement from damage. Damage to adjacent slabs may result in removal of additional slabs as directed by the RPR at the Contractor's expense.

The underlying material shall be repaired, re-compacted and shaped to grade.

Dowels of the size and spacing specified for other joints in similar pavement on the project shall be installed along all four (4) edges of the new slab in accordance with paragraph 501-4.10d.

1034 Placement of concrete shall be as specified for original construction. The joints around the new
1035 slab shall be prepared and sealed as specified for original construction.
1036

1037 **e. Spalls along joints.**

- 1038
- 1039 (1) Spalls less than one inch wide and less than the depth of the joint sealant reservoir, shall be
1040 filled with joint sealant material.
1041
- 1042 (2) Spalls larger than one inch and/or deeper than the joint reservoir, but less than 1/2 the slab
1043 depth, and less than 25% of the length of the adjacent joint shall be repaired as follows:
1044
- 1045 i. Make a vertical saw cut at least one inch (25 mm) outside the spalled area and to a
1046 depth of at least 2 inches (50 mm). Saw cuts shall be straight lines forming
1047 rectangular areas surrounding the spalled area.
1048
- 1049 ii. Remove unsound concrete and at least 1/2 inch (12 mm) of visually sound concrete
1050 between the saw cut and the joint or crack with a light chipping hammer.
1051
- 1052 iii. Clean cavity with high-pressure water jets supplemented with compressed air as
1053 needed to remove all loose material.
1054
- 1055 iv. Apply a prime coat of epoxy resin, Type III, Grade I, to the dry, cleaned surface of
1056 all sides and bottom of the cavity, except any joint face.
1057
- 1058 v. Fill the cavity with low slump concrete or mortar or with epoxy resin concrete or
1059 mortar.
1060
- 1061 vi. An insert or other bond-breaking medium shall be used to prevent bond at all joint
1062 faces.
1063
- 1064 vii. A reservoir for the joint sealant shall be sawed to the dimensions required for other
1065 joints, or as required to be routed for cracks. The reservoir shall be thoroughly
1066 cleaned and sealed with the sealer specified for the joints.
1067
- 1068 (3) Spalls deeper than 1/2 of the slab depth or spalls longer than 25% of the adjacent joint
1069 require replacement of the entire slab.
1070

1071 **f. Diamond grinding of Concrete surfaces.** Diamond grinding shall be completed prior to
1072 pavement grooving. Diamond grinding of the hardened concrete should not be performed until
1073 the concrete is at least 14 days old and has achieved full minimum strength. Equipment that
1074 causes ravels, aggregate fractures, spalls or disturbance to the joints will not be permitted. The
1075 depth of diamond grinding shall not exceed 1/2 inch (13 mm) and all areas in which diamond
1076 grinding has been performed will be subject to the final pavement thickness tolerances specified.
1077 Diamond grinding shall be performed with a machine specifically designed for diamond grinding
1078 capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm)
1079 wide with sufficient number of flush cut blades that create grooves between 0.090 and 0.130
1080 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than
1081 the bottom of the grinding cut. The Contractor shall determine the number and type of blades
1082 based on the hardness of the aggregate. Contractor shall demonstrate to the RPR that the
1083 grinding equipment will produce satisfactory results prior to making corrections to surfaces.
1084

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. All grinding shall be at the expense of the Contractor.

CONTRACTOR QUALITY CONTROL (CQC)

501-5.1 QUALITY CONTROL PROGRAM. The Contractor shall develop a Quality Control Program in accordance with Item C-100. No partial payment will be made for materials that are subject to specific quality control requirements without an approved quality control program.

501-5.2 CONTRACTOR QUALITY CONTROL (CQC). 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.

501-5.3 CONTRACTOR QC TESTING. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to this specification and as set forth in the CQCP. The testing program shall include, but not necessarily be limited to, tests for aggregate gradation, aggregate moisture content, slump, and air content. A QC Testing Plan shall be developed and approved by the RPR as part of the CQCP.

The RPR may at any time, notwithstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of concrete mixture which is rendered unfit for use due to contamination, segregation, or improper slump. Such rejection may be based on only visual inspection. 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.

a. Fine aggregate.

- (1) Gradation.** A sieve analysis shall be made at least twice daily in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.
- (2) Moisture content.** If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C70 or ASTM C566.
- (3) Deleterious substances.** Fine aggregate as delivered to the mixer shall be tested for deleterious substances in fine aggregate for concrete as specified in paragraph 501-2.1b, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

b. **Coarse Aggregate.**

(1) **Gradation.** A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) **Moisture content.** If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C566.

(3) **Deleterious substances.** Coarse aggregate as delivered to the mixer shall be tested for deleterious substances in coarse aggregate for concrete as specified in paragraph 501-2.1c, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

c. **Slump.** One test shall be made for each subplot. Slump tests shall be performed in accordance with ASTM C143 from material randomly sampled from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

d. **Air content.** One test shall be made for each subplot. Air content tests shall be performed in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

e. **Unit weight and Yield.** One test shall be made for each subplot. Unit weight and yield tests shall be in accordance with ASTM C138. The samples shall be taken in accordance with ASTM C172 and at the same time as the air content tests.

f. **Temperatures.** Temperatures shall be checked at least four times per lot at the job site in accordance with ASTM C1064.

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 (3.7 m) “straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) 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 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 (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 501-4.19f 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 501-6.6.

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 will be evaluated prior to and after placement of the concrete surface. 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 (12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR by the end of the following working day.

Areas with humps or depression that that exceed grade or smoothness 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. If these areas cannot be corrected with grinding then the slabs that are retaining water must be removed and replaced in accordance with paragraph 501-4.19d. Grinding shall be in accordance with paragraph 501-4.19f. All corrections will be at the Contractors expense.

501-5.4 CONTROL CHARTS. The Contractor shall maintain linear control charts for fine and coarse aggregate gradation, slump, and air content. The Contractor shall also maintain a control chart plotting the coarseness factor/workability factor from the combined gradations in accordance with paragraph 501-2.1d.

Control charts shall be posted in a location satisfactory to the RPR and shall be kept up to date at all times. 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, or Specification 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 potential problem and the Contractor is not taking satisfactory corrective action, the RPR may halt production or acceptance of the material.

- a. **Fine and coarse aggregate gradation.** The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Superimposed on the control charts shall be the action and suspension limits. Gradation tests shall be performed by the Contractor per ASTM C136. The Contractor shall take at least two samples per lot to check the final gradation. Sampling shall be per ASTM D75 from the flowing aggregate stream or conveyor belt.
- b. **Slump and air content.** The Contractor shall maintain linear control charts both for individual measurements and range (that is, difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.
- c. **Combined gradation.** The Contractor shall maintain a control chart plotting the coarseness factor and workability factor on a chart in accordance with paragraph 501-2.1d.

Control Chart Limits¹

Control Parameter	Individual Measurements	
	Action Limit	Suspension Limit
Gradation ²	*3	*3
Coarseness Factor (CF)	±3.5	±5
Workability Factor (WF)	±2	±3
Slump	+0.5 to -1 inch (+13 to -25 mm)	+1 to -1.5 inch (+25 to -38 mm)
Air Content	±1.5%	±2.0%

¹ Control charts shall developed and maintained for each control parameter indicated.

² Control charts shall be developed and maintained for each sieve size.

³ Action and suspension limits shall be determined by the Contractor.

501-5.5 CORRECTIVE ACTION AT SUSPENSION LIMIT. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of control. The CQCP shall detail what action will be taken to bring the process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

- a. Fine and coarse aggregate gradation. When two consecutive averages of five tests are outside of the suspension limits, immediate steps, including a halt to production, shall be taken to correct the grading.
- b. Coarseness and Workability factor. When the CF or WF reaches the applicable suspension limits, the Contractor, immediate steps, including a halt to production, shall be taken to correct the CF and WF.

- c. Fine and coarse aggregate moisture content. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5%, the scale settings for the aggregate batcher and water batcher shall be adjusted.
- d. Slump. The Contractor shall halt production and make appropriate adjustments whenever:
- (1) one point falls outside the Suspension Limit line for individual measurements
- OR
- (2) two points in a row fall outside the Action Limit line for individual measurements.
- e. Air content. The Contractor shall halt production and adjust the amount of air-entraining admixture whenever:
- (1) one point falls outside the Suspension Limit line for individual measurements
- OR
- (2) two points in a row fall outside the Action Limit line for individual measurements.

MATERIAL ACCEPTANCE

501-6.1 QUALITY ASSURANCE (QA) ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section, with the exception of coring for thickness determination, will be performed by the RPR. The Contractor shall provide adequate facilities for the initial curing of beams. The Contractor shall bear the cost of providing initial curing facilities and coring and filling operations, per paragraph 501-6.5b(1).

The samples will be transported while in the molds. The curing, except for the initial cure period, will be accomplished using the immersion in saturated lime water method. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60° to 80°F (16° to 27°C), and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather, or in heavyweight closed plastic bags, or using other suitable methods, provided the temperature and moisture loss requirements are met.

501-6.2 QUALITY ASSURANCE (QA) TESTING LABORATORY. Quality assurance testing organizations performing these acceptance tests will be accredited in accordance with ASTM C1077. The quality assurance laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods will be submitted to the RPR prior to start of construction.

501-6.3 LOT SIZE. Concrete will be accepted for strength and thickness on a lot basis. A lot will consist of a day's production not to exceed 2,000 cubic yards (1530 cubic meters). Each lot will be divided into approximately equal sublots with individual sublots between 400 to 600 cubic yards. Where three sublots are produced, they will constitute a lot. Where one or two sublots are produced, they will be incorporated into the previous or next lot. Where more than one plant is simultaneously producing concrete for the job, the lot sizes will apply separately for each plant.

501-6.4 PARTIAL LOTS. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot or for overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they will constitute a lot. Where one or two sublots have been produced, they will be incorporated into the next lot or the previous lot and the total number of sublots will be used in the acceptance criteria calculation, that is, $n=5$ or $n=6$.

501-6.5 ACCEPTANCE SAMPLING AND TESTING.

a. Strength.

(1) **Sampling.** One sample will be taken for each subplot from the concrete delivered to the job site. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. The concrete will be sampled in accordance with ASTM C172.

(2) **Test Specimens.** The RPR will be responsible for the casting, initial curing, transportation, and curing of specimens in accordance with ASTM C31. Two (2) specimens will be made from each sample and slump, air content, unit weight, and temperature tests will be conducted for each set of strength specimens. Within 24 to 48 hours, the samples will be transported from the field to the laboratory while in the molds. Samples will be cured in saturated lime water.

The strength of each specimen will be determined in accordance with ASTM C78. The strength for each subplot will be computed by averaging the results of the two test specimens representing that subplot.

(3) **Acceptance.** Acceptance of pavement for strength will be determined by the RPR in accordance with paragraph 501-6.6b(1). All individual strength tests within a lot will be checked for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and the remaining test values will be used to determine acceptance in accordance with paragraph 501-6.5b.

b. Pavement thickness.

(1) **Sampling.** One core will be taken by the Contractor for each subplot in the presence of the RPR. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. Areas, such as thickened edges, with planned variable thickness, will be excluded from sample locations.

Cores shall be a minimum 4 inch (100 mm) in diameter neatly cut with a core drill. The Contractor will furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes will be filled by the Contractor with a non-shrink grout approved by the RPR within one day after sampling.

(2) **Testing.** The thickness of the cores will be determined by the RPR by the average caliper measurement in accordance with ASTM C174. Each core shall be photographed and the photograph included with the test report.

(3) **Acceptance.** Acceptance of pavement for thickness will be determined by the RPR in accordance with paragraph 501-6.6.

501-6.6 ACCEPTANCE CRITERIA.

- a. General.** Acceptance will be based on the following characteristics of the completed pavement discussed in paragraph 501-6.5b:

- (1) Strength
- (2) Thickness
- (3) Grade
- (4) Profilograph smoothness (Not used)
- (5) Adjustments for repairs

Acceptance for strength, thickness, and grade, will be based on the criteria contained in accordance with paragraph 501-6.6b(1), 501-6.6b(2), and 501-6.6b(3), respectively. Production quality must achieve 90 PWL or higher to receive full payment.

Strength and thickness will be evaluated for acceptance on a lot basis using the method of estimating PWL. Production quality must achieve 90 PWL or higher to receive full payment. The PWL will be determined in accordance with procedures specified in Item C-110.

The lower specification tolerance limit (L) for strength and thickness will be:

Lower Specification Tolerance Limit (L)

Strength	$0.93 \times \text{strength specified in paragraph 501-3.3}$
Thickness	Lot Plan Thickness in inches, - 0.50 in

b. Acceptance criteria.

(1) Strength. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(2) Thickness. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(3) Grade. The final finished surface of the pavement of the completed project will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally. The documentation, stamped and signed by a licensed surveyor shall be in accordance with paragraph 501-5.3h. Payment for sublots that do not meet grade for over 25% of the subplot shall reduced by 5% and not be more than 95%.

(4) Profilograph roughness for QA Acceptance. Not used.

(5) Adjustments for repair. Sublots with spall repairs, crack repairs, or partial panel replacement, will be limited to no more than 95% payment.

(6) Adjustment for grinding. For sublots with grinding over 25% of a subplot, payment will be reduced 5%.

METHOD OF MEASUREMENT

501-7.1 Concrete pavement shall be measured by the number of square yards (square meters) of plain and reinforced pavement as specified in-place, completed and accepted. Additional pavement thickness

for thickened edge joints shall not be measured for payment but shall be incidental to the respective bid item for concrete pavement.

BASIS OF PAYMENT

501-8.1 PAYMENT. Payment for concrete pavement meeting all acceptance criteria as specified in paragraph 501-6.6. Acceptance Criteria shall be based on results of strength and thickness tests. Payment for acceptable lots of concrete pavement shall be adjusted in accordance with paragraph 501-8.1a for strength and thickness; 501-8.1b for repairs; 501-8.1c for grinding; and 501-8.1d for smoothness, subject to the limitation that:

The total project payment for concrete pavement shall not exceed 100 percent of the product of the contract unit price and the total number of square yards (square meters) of concrete pavement used in the accepted work (See Note 1 under the Price Adjustment Schedule table below).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings.

- a. **Basis of adjusted payment.** The pay factor for each individual lot shall be calculated in accordance with the Price Adjustment Schedule table below. A pay factor shall be calculated for both strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both strength and thickness are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either strength or thickness is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both strength and thickness are less than 100%.

Price Adjustment Schedule¹

Percentage of Materials Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 90	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 in excess of 100% shall be subject to the total project payment limitation specified in paragraph 501-8.1.

² The lot shall be removed and replaced unless, after receipt of FAA concurrence, the Owner and Contractor agree in writing that the lot will remain; the lot paid at 50% of the contract unit price; and the total project payment limitation reduced by the amount withheld for that lot.

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 501-8.1. Payment in excess of 100% for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100%; except for rejected lots which remain in place and/or sublots with adjustments for repairs.

- b. **Adjusted payment for repairs.** The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots which contain repairs in accordance with paragraph 501-4.19 on more than 20% of the slabs within the sublot. Payment factors greater than 100 percent for the strength and thickness cannot be used to offset adjustments for repairs.
- c. **Adjusted payment for grinding.** The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots with grinding over 25% of a sublot.
- d. **Profilograph Roughness.** Not used.
- e. **Payment. Payment shall be made under:**
- | | |
|-------------|--|
| Item P-501a | Portland Cement Concrete Pavement - per square yard (square meter) |
|-------------|--|

REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A996	Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
ASTM A1035	Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

1514	ASTM A1078	Standard Specification for Epoxy-Coated Steel Dowels for Concrete
1515		Pavement
1516		
1517	ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in
1518		Aggregate
1519		
1520	ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the
1521		Field
1522		
1523	ASTM C33	Standard Specification for Concrete Aggregates
1524		
1525	ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete
1526		Specimens
1527		
1528	ASTM C70	Standard Test Method for Surface Moisture in Fine Aggregate
1529		
1530	ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple
1531		Beam with Third-Point Loading)
1532		
1533	ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium
1534		Sulfate or Magnesium Sulfate
1535		
1536	ASTM C94	Standard Specification for Ready-Mixed Concrete
1537		
1538	ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
1539		
1540	ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in
1541		Mineral Aggregates by Washing
1542		
1543	ASTM C123	Standard Test Method for Lightweight Particles in Aggregate
1544		
1545	ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
1546		
1547	ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse
1548		Aggregate by Abrasion and Impact in the Los Angeles Machine
1549		
1550	ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse
1551		Aggregates
1552		
1553	ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content
1554		(Gravimetric) of Concrete
1555		
1556	ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
1557		
1558	ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
1559		
1560	ASTM C150	Standard Specification for Portland Cement
1561		
1562	ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
1563		
1564	ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
1565		

1566	ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the
1567		Volumetric Method
1568		
1569	ASTM C174	Standard Test Method for Measuring Thickness of Concrete Elements
1570		Using Drilled Concrete Cores
1571		
1572	ASTM C227	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate
1573		Combinations (Mortar-Bar Method)
1574		
1575	ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the
1576		Pressure Method
1577		
1578	ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
1579		
1580	ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete
1581		
1582	ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for
1583		Curing Concrete
1584		
1585	ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural
1586		Pozzolans for Use in Portland Cement Concrete
1587		
1588	ASTM C494	Standard Specification for Chemical Admixtures for Concrete
1589		
1590	ASTM C566	Standard Test Method for Total Evaporable Moisture Content of
1591		Aggregates by Drying
1592		
1593	ASTM C595	Standard Specification for Blended Hydraulic Cements
1594		
1595	ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural
1596		Pozzolan for Use in Concrete
1597		
1598	ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened
1599		Concrete
1600		
1601	ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and
1602		Thawing
1603		
1604	ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and
1605		Continuous Mixing
1606		
1607	ASTM C881	Standard Specification for Epoxy-Resin-Base Bonding Systems for
1608		Concrete
1609		
1610	ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
1611		
1612	ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing
1613		Flowing Concrete
1614		
1615	ASTM C1064	Test Method for Temperature of Freshly Mixed Hydraulic-Cement
1616		Concrete
1617		

1618	ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates
1619		for Use in Construction and Criteria for Testing Agency Evaluation
1620		
1621	ASTM C1157	Standard Performance Specification for Hydraulic Cement
1622		
1623	ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates
1624		(Mortar-Bar Method)
1625		
1626	ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in
1627		Portland Cement and Portland-Cement Clinker Using X-Ray Powder
1628		Diffraction Analysis
1629		
1630	ASTM C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity
1631		of Combinations of Cementitious Materials and Aggregate (Accelerated
1632		Mortar-Bar Method)
1633		
1634	ASTM C1602	Standard Specification for Mixing Water Used in the Production of
1635		Hydraulic Cement Concrete
1636		
1637	ASTM D75	Standard Practice for Sampling Aggregates
1638		
1639	ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete
1640		Paving and Structural Construction (Nonextruding and Resilient
1641		Bituminous Types)
1642		
1643	ASTM D1752	Standard Specification for Preformed Sponge Rubber and Cork and
1644		Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural
1645		Construction
1646		
1647	ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine
1648		Aggregate
1649		
1650	ASTM D3665	Standard Practice for Random Sampling of Construction Materials
1651		
1652	ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and
1653		Elongated Particles in Coarse Aggregate
1654		
1655	ASTM E178	Standard Practice for Dealing with Outlying Observations
1656		
1657	ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a
1658		Profilograph
1659		
1660	ASTM E2133	Standard Test Method for Using a Rolling Inclinator to Measure
1661		Longitudinal and Transverse Profiles of a Traveled Surface
1662		
1663	AMERICAN CONCRETE INSTITUTE (ACI)	
1664		
1665	ACI 305R	Guide to Hot Weather Concreting
1666		
1667	ACI 306R	Guide to Cold Weather Concreting
1668		
1669	ACI 309R	Guide for Consolidation of Concrete

1670 ADVISORY CIRCULARS (AC)
1671
1672 AC 150/5320-6 Airport Pavement Design and Evaluation
1673
1674 FEDERAL HIGHWAY ADMINISTRATION (FHWA)
1675
1676 HIPERPAV 3, version 3.2
1677
1678 PORTLAND CONCRETE ASSOCIATION (PCA)
1679
1680 PCA Design and Control of Concrete Mixtures, 16th Edition
1681
1682 U.S. ARMY CORPS OF ENGINEERS (USACE) CONCRETE RESEARCH DIVISION (CRD)
1683
1684 CRD C662 Determining the Potential Alkali-Silica Reactivity of Combinations of
1685 Cementitious Materials, Lithium Nitrate Admixture and Aggregate
1686 (Accelerated Mortar-Bar Method)
1687
1688 UNITED STATES AIR FORCE ENGINEERING TECHNICAL LETTER (ETL)
1689
1690 ETL 97-5 Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield
1691 Pavements
1692
1693
1694 ****END ITEM P-501****

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 D5893.

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 $25\% \pm 5\%$ 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, 15 days prior to use on the project.

- a. **Tractor-mounted routing tool.** Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.
- b. **Concrete saw.** Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

- c. **Sandblasting equipment.** The Contractor must demonstrate sandblasting equipment including the air compressor, 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 Resident Project Representative (RPR), that the method cleans the joint and does not damage the joint.
- 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. **Cold-applied, single-component sealing equipment.** The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 PREPARATION OF JOINTS. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

- a. **Sawing.** All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.
- b. **Sealing.** Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by sandblasting, tractor-mounted routing equipment, concrete saw, or waterblaster 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.
- b. **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.
- c. **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 1/4 inch (6 mm) \pm 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 (meter) of sealant in place, completed, and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint sealing material shall be made at the contract unit price per linear foot (meter). The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

P-605a Joint Sealant- 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)
-----------	--

156		
157	ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-
158		Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
159		
160	ASTM D5893	Standard Specification for Cold Applied, Single Component, Chemically
161		Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
162		
163	Advisory Circulars (AC)	
164		
165	AC 150/5340-30	Design and Installation Details for Airport Visual Aids
166		
167		
168		**END ITEM P-605**

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	Type	Application Rate Minimum
Waterborne Type I	White	37925	115 ft ² /gal	Type I, Gradation A	7 lb/gal
Waterborne Type I	Yellow	33538 or 33655	115 ft ² /gal	Type I, Gradation A	7 lb/gal
Waterborne Type I	Black	37038	115 ft ² /gal	Not Used	N/A

¹See paragraph 620-2.2a

²See paragraph 620-2.2b

- a. **Paint.** Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

1. **Waterborne.** Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

- b. **Preformed Thermoplastic Airport Pavement Markings.** Markings must be composed of ester modified resins in conjunction with aggregates, pigments, and binders that have been factory produced as a finished product. The material must be impervious to degradation by aviation fuels, motor fuels, and lubricants. The markings must be able to be applied in temperatures as low as 35°F without any special storage, preheating, or treatment of the material before application.

(a) The markings must be supplied with an integral, non-reflectorized black border.

(1) Graded glass beads.

(a) The material must contain a minimum of 30% intermixed graded glass beads by weight. The intermixed beads shall conform to Federal Specification TT-B-1325D, Type I, gradation A and Federal Specification TT-B-1325D, Type IV.

(b) The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of one (1) lb (0.45 kg) ($\pm 10\%$) per 10 square feet (1 sq m). These factory-applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

Preformed Thermoplastic Bead Gradation

Size Gradation		Retained, %	Passing, %
U.S. Mesh	μm		
12	1700	0 - 2	98 - 100
14	1400	0 - 3.5	96.5 - 100
16	1180	2 - 25	75 - 98
18	1000	28 - 63	37 - 72
20	850	63 - 72	28 - 37
30	600	67 - 77	23 - 33
50	300	89 - 95	5 - 11
80	200	97 - 100	0 - 3

(3) Heating indicators. The material manufacturer shall provide a method to indicate that the material has achieved satisfactory adhesion and proper bead embedment during application and that the installation procedures have been followed.

(4) Pigments. Percent by weight.

(a) White:

- Titanium Dioxide, ASTM D476, type II shall be 10% minimum.

(b) Yellow and Colors:

- Titanium Dioxide, ASTM D476, type II shall be 1% minimum.
- Organic yellow, other colors, and tinting as required to meet color standard.

(5) Prohibited materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant federal regulations.

(6) Daylight directional reflectance.

(a) White: The daylight directional reflectance of the white paint shall not be less than 75% (relative to magnesium oxide), when tested in accordance with ASTM E2302.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 45% (relative to magnesium oxide), when tested in accordance with ASTM E2302. The x and y values shall be consistent with the federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x	.462	x	.470	x	.479	x	.501
y	.438	y	.455	y	.428	y	.452

(7) **Skid resistance.** The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

(8) **Thickness.** The material must be supplied at a nominal thickness of 65 mil (1.7 mm).

(9) **Environmental resistance.** The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to aviation fuels, gasoline, and oil.

(10) **Retroreflectivity.** The material, when applied in accordance with manufacturer's guidelines, must demonstrate a uniform level of nighttime retroreflection when tested in accordance to ASTM E1710.

(11) **Packaging.** Packaging shall protect the material from environmental conditions until installation.

(12) Preformed thermoplastic airport pavement marking requirements.

(a) The markings must be a resilient thermoplastic product with uniformly distributed glass beads throughout the entire cross-sectional area. The markings must be resistant to the detrimental effects of aviation fuels, motor fuels and lubricants, hydraulic fluids, deicers, anti-icers, protective coatings, etc. Lines, legends, and symbols must be capable of being affixed to asphalt and/or Portland cement concrete pavements by the use of a large radiant heater. Colors shall be available as required.

(b) The markings must be capable of conforming to pavement contours, breaks, and faults through the action of airport traffic at normal pavement temperatures. The markings must be capable of fully conforming to grooved pavements, including pavement grooving per advisory circular (AC) 150/5320-12, current version. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastics when heated with a heat source per manufacturer's recommendation.

(c) Multicolored markings must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each large marking segment (typically more than 20 feet (6 m) long) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a marking segment. Obtaining multicolored effect by overlaying materials of different colors is not acceptable due to resulting inconsistent marking thickness and inconsistent application temperature in the marking/substrate interface.

(d) The marking material must set up rapidly, permitting the access route to be re-opened to traffic after application.

(e) The marking material shall have an integral color throughout the thickness of the marking material.

c. **Reflective media.** Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A.

1. Glass beads for red and pink paint shall meet the requirements for Type I, Gradation A.
2. 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.
3. Glass beads shall not be used in black and green paint.
4. 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 contaminants 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 manufacturers application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

The Contractor shall obliterate existing markings as shown on the plans or as directed by the RPR. Areas designated for removal of existing pavement markings by obliteration are noted on the plans. Paint removal shall not cause excessive damage to the pavement surface. If another method of obliteration is proposed by the Contractor, it shall be demonstrated to be effective, not cause excessive damage, and shall only be used subject to approval by the Engineer. Areas of paint removal, except those to be repainted, shall be cleaned of all debris and loose material, and then sealed with an approved bituminous fog seal material. Any damage to existing joint or crack seal material by obliteration operations shall be repaired by the Contractor at no cost to the Sponsor.

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.

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. To ensure minimum single-pass application time and optimum bond in the marking/substrate interface, the materials must be applied using a variable speed self-propelled mobile heater with an effective heating width of no less than 16 feet (5 m) and a free span between supporting wheels of no less than 18 feet (5.5 m). The heater must emit thermal radiation to the marking material in such a manner that the difference in temperature of 2 inches (50 mm) wide linear segments in the direction of heater travel must be within 5% of the overall average temperature of the heated thermoplastic material as it exits the heater. The material must be able to be applied at ambient and pavement temperatures down to 35°F (2°C) without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry, and free of debris. A non-volatile organic content (non-VOC) sealer with a maximum applied viscosity of 250 centiPoise must be applied to the pavement shortly before the markings are applied. The supplier must enclose application instructions with each box/package.

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 by the Contractor in the presence of the RPR, with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 readings shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

MINIMUM RETRO-REFLECTANCE VALUES

Material	Retro-reflectance mcd/m ² /lux		
	White	Yellow	Red
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	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 temporary runway, apron and taxiway markings to be paid for shall be the number of square feet performed in accordance with the specifications and accepted by the Engineer. Accepted quantities of reflective media as well as surface preparations shall be considered incidental to the permanent runway and taxiway markings and will not be measured separately for payment.

620-4.1b The quantity of permanent runway, apron and taxiway markings to be paid for shall be the number of square feet performed in accordance with the specifications and accepted by the Engineer. Accepted quantities of reflective media as well as surface preparations shall be considered incidental to the permanent runway and taxiway markings and will not be measured separately for payment.

620-4.2 The quantity of runway and taxiway marking obliteration to be paid for shall be the number of square feet of obliteration performed in accordance with the specifications and accepted by the Engineer.

620-4.3 The quantity of surface painted hold signs to be paid for shall be the number of signs painted and performed in accordance with the specifications and accepted by the Engineer.

BASIS OF PAYMENT

620-5.1a The quantity of temporary runway, apron and taxiway markings to be paid for shall be the number of square feet performed in accordance with the specifications and accepted by the Engineer. Accepted quantities of reflective media as well as surface preparations shall be considered incidental to the permanent runway and taxiway markings and will not be measured separately for payment.

620-5.1b The quantity of permanent runway, apron and taxiway markings to be paid for shall be the number of square feet performed in accordance with the specifications and accepted by the Engineer. Accepted quantities of reflective media as well as surface preparations shall be considered incidental to the permanent runway and taxiway markings and will not be measured separately for payment.

620-5.2 Payment shall be made at the respective contract price per square foot for runway and taxiway marking obliteration. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

620-5.3 Payment shall be made at the respective contract price per each for surface painted hold signs. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620a	Temporary Pavement Markings (White and Yellow) - per square foot (square meter)
Item P-620b	Permanent Pavement Markings (White and Yellow) - per square foot (square meter)
Item P-620c	Permanent Pavement Markings (Black) - per square foot (square meter)
Item P-620d	Pavement Marking Obliteration – per square foot (square meter)
Item P-620e	Thermoplastic Hold Position Signs – Each

REFERENCES

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

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24	Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings
29 CFR Part 1910.1200	Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D	Beads (Glass Spheres) Retro-Reflective
FED SPEC TT-P-1952F	Paint, Traffic and Airfield Marking, Waterborne
FED STD 595	Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 [Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces](#)****END OF ITEM P-620****

373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397

Intentionally Left Blank

ITEM T-901 SEEDING

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding with hydromulch, and fertilizing the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 SEED. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Seed Properties and Rate of Application

Seed	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application lb/acre (or lb/1,000 S.F.)
Tall Fescue	97%*	85%*	10 lbs per acre
Kentucky Blue Grass	85%	80%	20 lbs per acre

Seeding shall be performed during the period between March 1 and September 30 inclusive, unless otherwise approved by the RPR.

901-2.2 LIME. Not required.

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- (n-p-k) commercial fertilizer and shall be spread at the rate of 400 pounds per acre or as approved by the Engineer.

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.

901-2.5 HYDROMULCH. The material for hydromulch shall be a virgin wood cellulose fiber that is thermally produced, air dried and conforming to the following:

Percent Moisture Content	10 + 3 percent
Percent Organic Matter	99.3% + .2%
Percent Ash Content	0.7 + 0.2 percent
pH Range	4.9 + 0.5
Percent Water Holding Capacity	1200-1600 grams H ₂ O per 100 grams fiber
Water Soluble Dye	Green

901-2.6 TACKIFIER. Inorganic tackifier and asphaltic materials will not be permitted. The organic tackifier shall be a free-flowing, noncorrosive powder produced from natural plant gum of *Plantago Insulares* (Desert Indian Wheat) applied as recommended by the manufacturer.

901-2.7 SUBMITTALS. Material submittals are required on seed, mulch, and tackifier. No material shall be ordered until the Engineer has received and approved the material submittals.

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.

- 96 **b. Fertilizing.** Following advance preparations and cleanup fertilizer shall be uniformly spread at
97 the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3
- 98 **c. Seeding.** Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after
99 fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special
100 provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or
101 sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is
102 required at other than the seasons shown on the plans or in the special provisions, a cover crop
103 shall be sown by the same methods required for grass and legume seeding.
- 104
- 105 **d. Rolling.** After the seed has been properly covered, the seedbed shall be immediately compacted
106 by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter)
107 of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per
108 foot (223 to 298 kg per meter) of width for sandy or light soils.
- 109

110 901-3.3 WET APPLICATION METHOD.

111

- 112 **a. General.** The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying
113 them on the previously prepared seedbed in the form of an aqueous mixture and by using the
114 methods and equipment described herein. The rates of application shall be as specified in the
115 special provisions.
- 116

- 117 **b. Spraying equipment.** The spraying equipment shall have a container or water tank equipped with
118 a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the
119 entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container
120 or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the
121 solids in the mixture in complete suspension at all times until used.
- 122

123 The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters)
124 per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that
125 will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All
126 pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids.
127 The power unit for the pump and agitator shall have controls mounted so as to be accessible to
128 the nozzle operator. There shall be an indicating pressure gauge connected and mounted
129 immediately at the back of the nozzle.

130

131 The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be
132 rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to
133 at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve
134 connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can
135 control and regulate the amount of flow of mixture delivered to the nozzle. At least three different
136 types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying
137 from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range
138 ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall
139 be connected to the nozzle pipe by means of quick-release couplings.

140

141 In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15
142 m) in length shall be provided to which the nozzles may be connected.

143

- 144 **c. Mixtures.** Lime, if required, shall be applied separately, in the quantity specified, prior to the
145 fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to
146 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 with hydromulch to be paid for shall be the number of acres (sq m) measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

s901-5.1 Payment shall be made at the contract unit price per acre (sq m) or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item. No direct payment will be made for fertilizing, seedbed preparation, or hydromulching.

Payment will be made under:

Item 901a	Seeding with Hydromulch - per acre (sq m)
-----------	---

REFERENCES

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

ASTM International (ASTM)

ASTM C602	Standard Specification for Agricultural Liming Materials
-----------	--

Federal Specifications (FED SPEC)

FED SPEC	JJJ-S-181, Federal Specification, Seeds, Agricultural
----------	---

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports
----------------	--

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel
--

****END OF ITEM T-901****

ITEM 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, tabbed by specific section. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.
- f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for 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 B, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 Type C, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type THWN-2, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, THWN-2, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 BARE COPPER WIRE (COUNTERPOISE, BARE COPPER WIRE GROUND AND GROUND RODS). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet (2.54 m) long and 3/4 inch (19 mm) in diameter.

108-2.4 CABLE CONNECTIONS. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

- a. **The cast splice.** A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

- b. **The field-attached plug-in splice.** Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.
- c. **The factory-molded plug-in splice.** Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.
- d. **The taped or heat-shrink splice.** Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 SPLICER QUALIFICATIONS. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 CONCRETE. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 FLOWABLE BACKFILL. Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

108-2.8 CABLE IDENTIFICATION TAGS. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 TAPE. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 ELECTRICAL COATING. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 EXISTING CIRCUITS. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 DETECTABLE WARNING TAPE. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 GENERAL. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the RPR or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 INSTALLATION IN DUCT BANKS OR CONDUITS. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor's expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 INSTALLATION OF DIRECT-BURIED CABLE IN TRENCHES. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be

unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

a. **Trenching.** Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:

- When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.
- Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.

The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill material may alternatively be used.

Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

- (1) Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.
- (2) Trenching, etc., in cable areas shall then proceed, with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair or replacement.

b. **Backfilling.** After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables ; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches

(125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be backfill with controlled low strength material (CLSM) in accordance with P-153.

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 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 backfill with controlled low strength material (CLSM) in accordance with P-153. 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 "SPICE" 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 contaminants 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.

When a nonmetallic light base is used, the grounding electrode shall be bonded to the metallic light fixture or metallic base plate with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

- d. **Parallel Voltage Systems.** Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 COUNTERPOISE INSTALLATION ABOVE MULTIPLE CONDUITS AND DUCT BANKS. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 COUNTERPOISE INSTALLATION AT EXISTING DUCT BANKS. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 EXOTHERMIC BONDING. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

- a. All slag shall be removed from welds.
- b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.
- c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3MTM 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:

- a. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.
- b. That all affected circuits (existing and new) are free from unspecified grounds.
- c. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 50 megohms. Verify continuity of all series airfield lighting circuits prior to energization.
- d. 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.
- e. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.
- f. 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.
- g. 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 The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be included in the unit price bid for the work.

108-4.2 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet (meters) installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack. Cable and counterpoise slack is considered incidental to this item and is included in the Contractor's unit price. No separate measurement or payment will be made for cable or counterpoise slack.

108-4.3 No separate payment will be made for ground rods.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or conduit, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

Item L-108a	Install #8 AWG, L-824C, 5000V, Wire – per linear foot
Item L-108b	Install #6 AWG, Bare Copper Counterpoise Including Ground Rods and Terminations – 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

619	ASTM International (ASTM)	
620		
621	ASTM B3	Standard Specification for Soft or Annealed Copper Wire
622		
623	ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors,
624		Hard, Medium-Hard, or Soft
625		
626	ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for
627		Electrical Purposes
628		
629	ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically
630		Insulating Rubber Tapes
631		
632	Mil Spec	
633		
634	MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone
635		Rubber, Electrical
636		
637	MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive
638		
639	National Fire Protection Association (NFPA)	
640		
641	NFPA-70	National Electrical Code (NEC)
642		
643	NFPA-780	Standard for the Installation of Lightning Protection Systems
644		
645	American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)	
646		
647	ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth
648		Surface Potentials of a Ground System
649		
650	Federal Aviation Administration Standard	
651		
652	FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding
653		Requirements for Facilities and Electronic Equipment
654		
655		
656	**END OF ITEM L-108**	
657		

658

Intentionally Left Blank

ITEM L-110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits and removal of existing duct banks. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

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. ^[11]~~SEP~~
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

- a. Type I—Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.
- b. Type II—Schedule 40 PVC suitable for either above ground or underground use.
- c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.
- d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 SPLIT CONDUIT. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 CONDUIT SPACERS. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 CONCRETE. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 PRECAST CONCRETE STRUCTURES. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 FLOWABLE BACKFILL. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 DETECTABLE WARNING TAPE. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 GENERAL. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be 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 not less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 MARKERS. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep

or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 BACKFILLING FOR CONDUITS. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 BACKFILLING FOR DUCT BANKS. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 RESTORATION. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include seeding shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 OWNERSHIP OF REMOVED CABLE. The Contractor shall remove all abandoned/unused conductors contained in conduits in which new conductors will be installed. No abandoned conductors shall be left in place at the completion of the job. All removed wire shall become the property of the Contractor and the Contractor shall be held responsible for removing the wire off airport property. The removal of existing conductors shall be considered incidental to the respective duct pay item and no separate payment will be made.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet (meter) of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110a	Install 1-2" SCH. 40 PVC Duct, Direct Earth Buried – per linear foot
Item L-110b	Install 1-2" SCH. 40 PVC Duct, Concrete Encased – per linear foot
Item L-110c	Install 4-2" SCH. 40 PVC Duct, Concrete Encased – 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
---------------	--

408	UL Standard 514B	Conduit, Tubing, and Cable Fittings
409		
410	UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
411		
412	UL Standard 1242	Electrical Intermediate Metal Conduit Steel
413		
414	UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
415		
416	UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit
417		
418		
419		**END OF ITEM L-110**
420		

Intentionally Left Blank

ITEM L-115 ELECTRICAL MANHOLES AND JUNCTION STRUCTURES

DESCRIPTION

115-1.1 This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR including removal of existing manholes and junction structures as shown on the plans.

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. All concrete used in structures shall conform to the requirements of Item P-610, Concrete for Miscellaneous Structures.

115-2.7 FRAMES AND COVERS. The frames shall conform to one of the following requirements:

- | | | |
|----|--------------------|--|
| a. | ASTM A48 | Gray iron castings |
| b. | ASTM A47 | Malleable iron castings |
| c. | ASTM A27 | Steel castings |
| d. | ASTM A283, Grade D | Structural steel for grates and frames |
| e. | ASTM A536 | Ductile iron castings |
| f. | ASTM A897 | Austempered ductile iron castings |

All castings specified shall withstand a maximum tire pressure of 250 psi and maximum load of 100,000 lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word "ELECTRIC" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 LADDERS. Ladders, if specified, shall be galvanized steel or as shown on the plans.

115-2.9 REINFORCING STEEL. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.10 BEDDING/SPECIAL BACKFILL. Bedding or special backfill shall be as shown on the plans.

115-2.11 FLOWABLE BACKFILL. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.12 CABLE TRAYS. Cable trays shall be of galvanized steel]. Cable trays shall be located as shown on the plans.

115-2.13 PLASTIC CONDUIT. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.14 CONDUIT TERMINATORS. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.15 PULLING-IN IRONS. Pulling-in irons shall be manufactured with 7/8-inch (22 mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch (12 mm) diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

115-2.16 GROUND RODS. Ground rods shall be one piece, copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 8 feet (2.4 m) long nor less than 5/8 inch (16 mm) in diameter.

CONSTRUCTION METHODS

115-3.1 UNCLASSIFIED EXCAVATION. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 CONCRETE STRUCTURES. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

115-3.3 PRECAST UNIT INSTALLATIONS. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 PLACEMENT AND TREATMENT OF CASTINGS, FRAMES AND FITTINGS. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 INSTALLATION OF LADDERS. Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

115-3.6 REMOVAL OF SHEETING AND BRACING. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches (150 mm) of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

115-3.7 BACKFILLING. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches (150 mm) in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

115-3.8 CONNECTION OF DUCT BANKS. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 GROUNDING. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches (150 mm) above the floor. The ground rod shall be installed within one foot (30 cm) of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch (100 mm) diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot (30 cm) above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtailed shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus

shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

115-3.10 CLEANUP AND REPAIR. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 RESTORATION. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 INSPECTION. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 MANHOLE ELEVATION ADJUSTMENTS. The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

115-3.14 DUCT EXTENSION TO EXISTING DUCTS. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts

together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering; sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing

115-4.2 Manhole elevation adjustments shall be measured by the completed unit installed, in place, completed, and accepted. Separate measurement shall not be made for the various types and sizes.

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

115-5.2 Payment shall be made at the contract unit price for manhole elevation adjustments. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

Payment will be made under:

L-115a	Remove L-867B Junction Box, Complete – Per Each
L-115b	Install L-867B Junction Box, Complete – Per Each

REFERENCES

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

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
------------------	---

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors

364		
365	AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction
366		Boxes, and Accessories
367		
368	AC 150/5340-30	Design and Installation Details for Airport Visual Aids
369		
370	AC 150/5345-53	Airport Lighting Equipment Certification Program
371		
372	Commercial Item Description (CID)	
373		
374	A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)
375		
376	ASTM International (ASTM)	
377		
378	ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
379		
380	ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
381		
382	ASTM A48	Standard Specification for Gray Iron Castings
383		
384	ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and
385		Steel Products
386		
387	ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon
388		Steel Plates
389		
390	ASTM A536	Standard Specification for Ductile Iron Castings
391		
392	ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for
393		Concrete Reinforcement
394		
395	ASTM A897	Standard Specification for Austempered Ductile Iron Castings
396		
397	ASTM C144	Standard Specification for Aggregate for Masonry Mortar
398		
399	ASTM C150	Standard Specification for Portland Cement
400		
401	ASTM C206	Standard Specification for Finishing Hydrated Lime
402		
403	FAA Engineering Brief (EB)	
404		
405	EB #83	In Pavement Light Fixture Bolts
406		
407	Mil Spec	
408		
409	MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair
410		
411	National Fire Protection Association (NFPA)	
412		
413	NFPA-70	National Electrical Code (NEC)
414		
415	**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 perform as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.
- b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.
- c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.
- d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.
- e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

All LED light fixtures, with the exception of obstruction lighting (AC 150/5345-43) must be warranted by the manufacturer for a minimum of 4 years after date of installation inclusive of all electronics.” Obstruction lighting warranty is set by the individual manufacturer.

125-2.2 CONDUIT/DUCT. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 CABLE AND COUNTERPOISE. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 TAPE. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 CABLE CONNECTIONS. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 RETROREFLECTIVE MARKERS. Not required.

125-2.7 RUNWAY AND TAXIWAY LIGHTS. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

Lights

Type	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
L-861T	2	1	N/A	N/A	L-867	Blue	L-830	LED w heater
L-862	2	1	N/A	N/A	L-867	Clear	L-830	Quartz

125-2.8 RUNWAY AND TAXIWAY SIGNS. Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44.

Signs

Type	Size	Style	Class	Mode	Notes
L-858 Y	1	2	2	2	LED
L-858 L	1 or 3	2	2	2	LED
L-858 R	3	2	2	2	LED

125-2.9 RUNWAY END IDENTIFIER LIGHT (REIL). Not required.

125-2.10 PRECISION APPROACH PATH INDICATOR (PAPI). Not required.

125-2.11 CIRCUIT SELECTOR CABINET. Not required.

125-2.12 LIGHT BASE AND TRANSFORMER HOUSINGS. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867, Class 1A or 1B, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.13 ISOLATION TRANSFORMERS. Isolation Transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47.

INSTALLATION

125-3.1 INSTALLATION. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 TESTING. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

125-3.3 SHIPPING AND STORAGE. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 ELEVATED AND IN-PAVEMENT LIGHTS. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

METHOD OF MEASUREMENT

125-4.1 Runway and taxiway lights will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR. Runway End Identifier Lights shall be measured by each system installed as a completed unit in place, ready for operation, and accepted by the RPR.

Precision Approach Path Indicator shall be measured by each system installed as a completed unit, in place, ready for operation, and accepted by the RPR. Abbreviated Precision Approach Path Indicator shall be measured by each system installed as a completed unit, in place, ready for operation, and accepted by the RPR.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete runway or taxiway light, guidance sign, reflective marker, runway end identification light, precision approach path indicator, or abbreviated

precision approach path indicator installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

L-125a	Remove Taxiway Edge Light, Complete – per each
L-125b	Remove Runway In-Pavement Light, Complete – per each
L-125c	Install L-862 Runway Edge Light, Base Mounted, White/White Lens, Complete - per each
L-125d	Reinstall L-861T LED Taxiway Edge Light – per each
L-125e	Install L-861T LED Taxiway Edge Light – per each
L-125f	Remove L-858 Guidance Sign, Complete – per each
L-125g	Reinstall 1 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Four New Panels, Complete – per each
L-125h	Reinstall 2 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Six New Panels, Complete – per each
L-125i	Reinstall 3 Module L-858 Guidance Sign on New Concrete Pad with Six New Panels, Complete – per each
L-125j	Extend Existing 1 Module L-858 Guidance Sign Base to 2 Module Base and Install 4 New Panels, Complete – per each
L-125k	Extend Existing 2 Module L-858 Guidance Sign Base to 3 Module Base and Install 6 New Panels, Complete – per each
L-125l	Remove Existing Panels from 2 Module L-858 Guidance Sign and Install 4 New Panels, Complete – per each
L-125m	Remove Existing Panels from 3 Module L-858 Guidance Sign and Install 6 New Panels, Complete – per each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities

195	AC 150/5340-30	Design and Installation Details for Airport Visual Aids
196		
197	AC 150/5345-5	Circuit Selector Switch
198		
199	AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting
200		Circuits
201		
202	AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
203		
204	AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
205		
206	AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
207		
208	AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction
209		Boxes, and Accessories
210		
211	AC 150/5345-44	Specification for Runway and Taxiway Signs
212		
213	AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
214		
215	AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting
216		Systems
217		
218	AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
219		
220	AC 150/5345-53	Airport Lighting Equipment Certification Program
221		
222	Engineering Brief (EB)	
223		
224	EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and
225		Obstruction Lighting Fixtures
226		
227		
228		**END OF ITEM L-125**
229		

APPENDIX A

FAA ADVISORY CIRCULAR 150/5370-2 OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: Operational Safety on
Airports During Construction

Date: 12/13/2017

Initiated By: AAS-100

AC No: 150/5370-2G

Change:

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction*, dated September 29, 2011.

3 **Application.**

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. Appendix A contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

5 **Principal Changes.**

The AC incorporates the following principal changes:

1. Notification about impacts to both airport owned and FAA-owned NAVAIDs was added. See paragraph 2.13.5.3, NAVAIDs.

2. Guidance for the use of orange construction signs was added. See paragraph 2.18.4.2, Temporary Signs.
3. Open trenches or excavations may be permitted in the taxiway safety area while the taxiway is open to aircraft operations, subject to restrictions. See paragraph 2.22.3.4, Excavations.
4. Guidance for temporary shortened runways and displaced thresholds has been enhanced. See Figure 2-1 and Figure 2-2.
5. Figures have been improved and a new Appendix F on the placement of orange construction signs has been added.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the “ALT” and “ ← ” keys simultaneously.

Figures in this document are schematic representations and are not to scale.

6 **Use of Metrics.**

Throughout this AC, U.S. customary units are used followed with “soft” (rounded) conversion to metric units. The U.S. customary units govern.

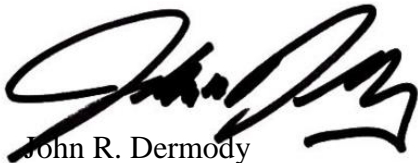
7 **Where to Find this AC.**

You can view a list of all ACs at

http://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at http://www.faa.gov/regulations_policies/faa_regulations/.

8 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.



John R. Dermody

Director of Airport Safety and Standards

CONTENTS

Paragraph	Page
Chapter 1. Planning an Airfield Construction Project	1-1
1.1 Overview.....	1-1
1.2 Plan for Safety.....	1-1
1.3 Develop a Construction Safety and Phasing Plan (CSPP).....	1-3
1.4 Who Is Responsible for Safety During Construction?.....	1-4
Chapter 2. Construction Safety and Phasing Plans	2-1
2.1 Overview.....	2-1
2.2 Assume Responsibility.....	2-1
2.3 Submit the CSPP.....	2-1
2.4 Meet CSPP Requirements.....	2-2
2.5 Coordination.	2-6
2.6 Phasing.....	2-7
2.7 Areas and Operations Affected by Construction Activity.	2-7
2.8 Navigation Aid (NAVAID) Protection.....	2-11
2.9 Contractor Access.	2-11
2.10 Wildlife Management.	2-15
2.11 Foreign Object Debris (FOD) Management.	2-16
2.12 Hazardous Materials (HAZMAT) Management.....	2-16
2.13 Notification of Construction Activities.....	2-16
2.14 Inspection Requirements.....	2-18
2.15 Underground Utilities.	2-19
2.16 Penalties.	2-19
2.17 Special Conditions.	2-19
2.18 Runway and Taxiway Visual Aids.	2-19
2.19 Marking and Signs for Access Routes.	2-29
2.20 Hazard Marking, Lighting and Signing.	2-30
2.21 Work Zone Lighting for Nighttime Construction.....	2-32
2.22 Protection of Runway and Taxiway Safety Areas.	2-33
2.23 Other Limitations on Construction.	2-37

Chapter 3. Guidelines for Writing a CSPP	3-1
3.1 General Requirements.....	3-1
3.2 Applicability of Subjects.....	3-1
3.3 Graphical Representations.	3-1
3.4 Reference Documents.	3-2
3.5 Restrictions.	3-2
3.6 Coordination.	3-2
3.7 Phasing.....	3-2
3.8 Areas and Operations Affected by Construction.	3-2
3.9 NAVAID Protection.	3-2
3.10 Contractor Access.	3-3
3.11 Wildlife Management.	3-4
3.12 FOD Management.....	3-4
3.13 HAZMAT Management.....	3-4
3.14 Notification of Construction Activities.....	3-4
3.15 Inspection Requirements.....	3-5
3.16 Underground Utilities.	3-5
3.17 Penalties.	3-5
3.18 Special Conditions.	3-5
3.19 Runway and Taxiway Visual Aids.	3-6
3.20 Marking and Signs for Access Routes.	3-6
3.21 Hazard Marking and Lighting.....	3-6
3.22 Work Zone Lighting for Nighttime Construction.	3-6
3.23 Protection of Runway and Taxiway Safety Areas.	3-7
3.24 Other Limitations on Construction.	3-7
Appendix A. Related Reading Material	A-1
Appendix B. Terms and Acronyms	B-1
Appendix C. Safety and Phasing Plan Checklist.....	C-1
Appendix D. Construction Project Daily Safety Inspection Checklist.....	D-1
Appendix E. Sample Operational Effects Table.....	E-1
Appendix F. Orange Construction Signs	F-1

FIGURES

Number	Page
Figure 2-1. Temporary Partially Closed Runway	2-9
Figure 2-2. Temporary Displaced Threshold.....	2-10
Figure 2-3. Markings for a Temporarily Closed Runway.....	2-21
Figure 2-4. Temporary Taxiway Closure.....	2-22
Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads	2-24
Figure 2-6. Lighted X in Daytime.....	2-26
Figure 2-7. Lighted X at Night.....	2-26
Figure 2-8. Interlocking Barricades	2-31
Figure 2-9. Low Profile Barricades	2-32
Figure E-1. Phase I Example	E-1
Figure E-2. Phase II Example	E-2
Figure E-3. Phase III Example.....	E-3
Figure F-1. Approved Sign Legends.....	F-1
Figure F-2. Orange Construction Sign Example 1.....	F-2
Figure F-3. Orange Construction Sign Example 2.....	F-3

TABLES

Number	Page
Table A-1. FAA Publications	A-1
Table A-2. Code of Federal Regulation.....	A-3
Table B-1. Terms and Acronyms.....	B-1
Table C-1. CSPP Checklist.....	C-1
Table D-1. Potentially Hazardous Conditions	D-1
Table E-1. Operational Effects Table	E-4
Table E-2. Runway and Taxiway Edge Protection.....	E-6
Table E-3. Protection Prior to Runway Threshold.....	E-7

Page Intentionally Blank

CHAPTER 1. PLANNING AN AIRFIELD CONSTRUCTION PROJECT

1.1 Overview.

Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

1.2 Plan for Safety.

Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified and their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

1.2.1 Identify Affected Areas.

The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

1.2.2 Describe Current Operations.

Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the airplanes that operate on each runway; the ADG and Taxiway Design Group (TDG)¹ for each affected taxiway; designated approach visibility minimums;

¹ Find Taxiway Design Group information in AC 150/5300-13, Airport Design.

available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System (SMGCS) plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

1.2.3 Allow for Temporary Changes to Operations.

To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways, and other changes. An example of a table showing temporary operations versus current operations is shown in Appendix E.

1.2.4 Take Required Measures to Revise Operations.

Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary widely among airports, this AC presents general guidance on those subjects.

1.2.5 Manage Safety Risk.

The FAA is committed to incorporating proactive safety risk management (SRM) tools into its decision-making processes. FAA Order 5200.11, *FAA Airports (ARP) Safety Management System (SMS)*, requires the FAA to conduct a Safety Assessment for certain triggering actions. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA determine whether a Safety Assessment is required prior to FAA approval of the CSPP. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for a Safety Risk Assessment. If the FAA requires an assessment, the airport operator must at a minimum:

1. Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.
2. Provide documents identified by the FAA as necessary to conduct SRM.
3. Participate in the SRM process for airport projects.
4. Provide a representative to participate on the SRM panel.

5. Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

1.3 **Develop a Construction Safety and Phasing Plan (CSPP).**

Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix A for a list of related reading material.

1.3.1 List Requirements.

A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or located on an airport certificated under Part 139. For on-airfield construction projects at Part 139 airports funded without AIP funds, the preparation of a CSPP represents an acceptable method the certificate holder may use to meet Part 139 requirements during airfield construction activity. As per FAA Order 5200.11, projects that require Safety Assessments do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 1.2.5).

1.3.2 Prepare a Safety Plan Compliance Document (SPCD).

The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

1.3.3 Assume Responsibility for the CSPP.

The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

1.4 **Who Is Responsible for Safety During Construction?**

1.4.1 Establish a Safety Culture.

Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others, such as military personnel at any airport supporting military operations (e.g. national guard or a joint use facility). Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

1.4.2 Assess Airport Operator's Responsibilities.

An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

- 1.4.2.1 Develop a CSPP that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.
- 1.4.2.2 Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.
- 1.4.2.3 Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5370-12, Quality Management for Federally Funded Airport Construction Projects. (Note “FAA” refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)
- 1.4.2.4 Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.
- 1.4.2.5 Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.
- 1.4.2.6 Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.
- 1.4.2.7 Ensure construction personnel know applicable airport procedures and changes to those procedures that may affect their work.
- 1.4.2.8 Ensure that all temporary construction signs are located per the scheduled list for each phase of the project.
- 1.4.2.9 Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.
- 1.4.2.10 Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.
- 1.4.2.11 At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

- 1.4.2.12 Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
 - 1.4.2.13 Take immediate action to resolve safety deficiencies.
 - 1.4.2.14 At airports subject to 49 CFR Part 1542, *Airport Security*, ensure construction access complies with the security requirements of that regulation.
 - 1.4.2.15 Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).
 - 1.4.2.16 Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.
 - 1.4.2.17 Ensure prompt transmission of the Airport Sponsor Strategic Event Submission, FAA Form 6000-26, located at https://oeaaa.faa.gov/oeaaa/external/content/AIRPORT_SPONSOR_STRATEGIC_EVENT_SUBMISSION_FORM.pdf, to assure proper coordination for NAS Strategic Interruption per Service Level Agreement with ATO.
 - 1.4.2.18 Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. The FAA Airports Regional or District office will determine if further coordination within the FAA is needed. Coordinate with appropriate local and other federal government agencies, such as Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Transportation Security Administration (TSA), and the state environmental agency.
- 1.4.3 Define Construction Contractor's Responsibilities.
- The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

- 1.4.3.1 Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supply any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor, indicating an understanding of the operational safety requirements of the CSPP and the assertion of compliance with the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.
- 1.4.3.2 Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.
- 1.4.3.3 Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.
- 1.4.3.4 Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
- 1.4.3.5 Conduct sufficient inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
- 1.4.3.6 Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.
- 1.4.3.7 Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.
- 1.4.3.8 Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>.

- 1.4.3.9 Ensure that all necessary safety mitigations are understood by all parties involved, and any special requirements of each construction phase will be fulfilled per the approved timeframe.
- 1.4.3.10 Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

1.4.4 Define Tenant's Responsibilities.

If planning construction activities on leased property, Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction are strongly encouraged to:

1. Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator. The airport operator may forgo a complete CSPP submittal and instead incorporate appropriate operational safety principles and measures addressed in the advisory circular within their tenant lease agreements.
2. In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval issued prior to issuance of a Notice to Proceed.
3. Ensure that construction personnel are familiar with safety procedures and regulations on the airport during all phases of the construction.
4. Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
5. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
6. Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.
7. Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, as specified in the CSPP and SPCD.
8. Ensure prompt submittal through the airport operator of Form 7460-1 for conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>.
9. Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

CHAPTER 2. CONSTRUCTION SAFETY AND PHASING PLANS

2.1 Overview.

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

2.2 Assume Responsibility.

Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

2.3 Submit the CSPP.

Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5×11 inch or 11×17 inch format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

2.3.1 Submit an Outline/Draft.

By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

2.3.2 Submit a CSPP.

The CSPP should be formally submitted for FAA approval when the project design is 80 percent to 90 percent complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

2.3.3 Submit an SPCD.

The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

2.3.4 Submit CSPP Revisions.

All revisions to a previously approved CSPP must be re-submitted to the FAA for review and approval/disapproval action.

2.4 **Meet CSPP Requirements.**

2.4.1 To the extent possible, the CSPP should address the following as outlined in Chapter 3, Guidelines for Writing a CSPP. Details that cannot be determined at this stage are to be included in the SPCD.

1. Coordination.
 - a. Contractor progress meetings.
 - b. Scope or schedule changes.
 - c. FAA ATO coordination.
2. Phasing.
 - a. Phase elements.
 - b. Construction safety drawings.
3. Areas and operations affected by the construction activity.
 - a. Identification of affected areas.
 - b. Mitigation of effects.
4. Protection of navigation aids (NAVAIDs).
5. Contractor access.
 - a. Location of stockpiled construction materials.
 - b. Vehicle and pedestrian operations.
6. Wildlife management.
 - a. Trash.
 - b. Standing water.
 - c. Tall grass and seeds.
 - d. Poorly maintained fencing and gates.
 - e. Disruption of existing wildlife habitat.
7. Foreign Object Debris (FOD) management.
8. Hazardous materials (HAZMAT) management.
9. Notification of construction activities.

- a. Maintenance of a list of responsible representatives/ points of contact.
 - b. NOTAM.
 - c. Emergency notification procedures.
 - d. Coordination with ARFF Personnel.
 - e. Notification to the FAA.
10. Inspection requirements.
- a. Daily (or more frequent) inspections.
 - b. Final inspections.
11. Underground utilities.
12. Penalties.
13. Special conditions.
14. Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.
- a. General.
 - b. Markings.
 - c. Lighting and visual NAVAIDs.
 - d. Signs, temporary, including orange construction signs, and permanent signs.
15. Marking and signs for access routes.
16. Hazard marking and lighting.
- a. Purpose.
 - b. Equipment.
17. Work zone lighting for nighttime construction (if applicable).
18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces.
- a. Runway Safety Area (RSA).
 - b. Runway Object Free Area (ROFA).
 - c. Taxiway Safety Area (TSA). Provide details for any adjustments to Taxiway Safety Area width to allow continued operation of smaller aircraft. See paragraph 2.22.3.
 - d. Taxiway Object Free Area (TOFA). Provide details for any continued aircraft operations while construction occurs within the TOFA. See paragraph 2.22.4.
 - e. Obstacle Free Zone (OFZ).
 - f. Runway approach/departure surfaces.
19. Other limitations on construction.
- a. Prohibitions.

b. Restrictions.

2.4.2 The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, “I, (Name of Contractor), have read the (Title of Project) CSPP, approved on (Date), and will abide by it as written and with the following additions as noted:”). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, “No supplemental information,” should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

1. Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
2. Phasing. Discuss proposed construction schedule elements, including:
 - a. Duration of each phase.
 - b. Daily start and finish of construction, including “night only” construction.
 - c. Duration of construction activities during:
 - i. Normal runway operations.
 - ii. Closed runway operations.
 - iii. Modified runway “Aircraft Reference Code” usage.
3. Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.
4. Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.
5. Contractor access. Provide the following:
 - a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
 - b. Listing of individuals requiring driver training (for certificated airports and as requested).
 - c. Radio communications.
 - i. Types of radios and backup capabilities.
 - ii. Who will be monitoring radios.
 - iii. Who to contact if the ATCT cannot reach the contractor’s designated person by radio.

- d. Details on how the contractor will escort material delivery vehicles.
- 6. Wildlife management. Discuss the following:
 - a. Methods and procedures to prevent wildlife attraction.
 - b. Wildlife reporting procedures.
- 7. Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.
- 8. Hazardous Materials (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.
- 9. Notification of construction activities. Provide the following:
 - a. Contractor points of contact.
 - b. Contractor emergency contact.
 - c. Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
 - d. Batch plant details, including 7460-1 submittal.
- 10. Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.
- 11. Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.
- 12. Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.
- 13. Special conditions. Discuss proposed actions for each special condition identified in the CSPP.
- 14. Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
 - a. Equipment and methods for covering signage and airfield lights.
 - b. Equipment and methods for temporary closure markings (paint, fabric, other).
 - c. Temporary orange construction signs.
 - d. Types of temporary Visual Guidance Slope Indicators (VGSI).
- 15. Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.
- 16. Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.
- 17. Work zone lighting for nighttime construction (if applicable). Discuss proposed equipment, locations, aiming, and shielding to prevent interference with air traffic control and aircraft operations.

18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
 - a. Equipment and methods for maintaining Taxiway Safety Area standards.
 - b. Equipment and methods to ensure the safe passage of aircraft where Taxiway Safety Area or Taxiway Object Free Area standards cannot be maintained.
 - c. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
19. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

2.5 **Coordination.**

Airport operators, or tenants responsible for design, bidding and conducting construction on their leased properties, should ensure at all project developmental stages, such as predesign, prebid, and preconstruction conferences, they capture the subject of airport operational safety during construction (see AC 150/5370-12, *Quality Management for Federally Funded Airport Construction Projects*). In addition, the following should be coordinated as required:

2.5.1 Progress Meetings.

Operational safety should be a standing agenda item for discussion during progress meetings throughout the project developmental stages.

2.5.2 Scope or Schedule Changes.

Changes in the scope or duration at any of the project stages may require revisions to the CSPP and review and approval by the airport operator and the FAA (see paragraph 1.4.2.17).

2.5.3 FAA ATO Coordination.

Early coordination with FAA ATO is highly recommended during the design phase and is required for scheduling Technical Operations shutdowns prior to construction. Coordination is critical to restarts of NAVAID services and to the establishment of any special procedures for the movement of aircraft. Formal agreements between the airport operator and appropriate FAA offices are recommended. All relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, should be coordinated with FAA ATO and may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See paragraph 2.13.5.3.2 for required FAA notification regarding FAA-owned NAVAIDs.)

2.6 **Phasing.**

Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In this case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

2.6.1 Phase Elements.

For each phase the CSPP should detail:

- Areas closed to aircraft operations.
- Duration of closures.
- Taxi routes and/or areas of reduced TSA and TOFA to reflect reduced ADG use.
- ARFF access routes.
- Construction staging, disposal, and cleanout areas.
- Construction access and haul routes.
- Impacts to NAVAIDs.
- Lighting, marking, and signing changes.
- Available runway length and/or reduced RSA and ROFA to reflect reduced ADG use.
- Declared distances (if applicable).
- Required hazard marking, lighting, and signing.
- Work zone lighting for nighttime construction (if applicable).
- Lead times for required notifications.

2.6.2 Construction Safety Drawings.

Drawings specifically indicating operational safety procedures and methods in affected areas (i.e., construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should also be included in the contract drawing package.

2.7 **Areas and Operations Affected by Construction Activity.**

Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA ATO will support operational simulations. See Appendix E for an example of a table showing temporary operations versus current operations. The tables in Appendix E can be useful for coordination among all interested parties, including FAA Lines of Business.

2.7.1 Identification of Affected Areas.

Identifying areas and operations affected by the construction helps to determine possible safety problems. The affected areas should be identified in the construction safety drawings for each construction phase. (See paragraph 2.6.2.) Of particular concern are:

2.7.1.1 **Closing, or Partial Closing, of Runways, Taxiways and Aprons, and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or takeoff in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is normally available for take-off in the direction of the displacement and for landing and takeoff in the opposite direction. Misunderstanding this difference, may result in issuance of an inaccurate NOTAM, and can lead to a hazardous condition.

2.7.1.1.1 Partially Closed Runways.

The temporarily closed portion of a partially closed runway will generally extend from the threshold to a taxiway that may be used for entering and exiting the runway. If the closed portion extends to a point between taxiways, pilots will have to back-taxi on the runway, which is an undesirable operation. See Figure 2-1 for a desirable configuration.

2.7.1.1.2 Displaced Thresholds.

Since the portion of the runway pavement between the permanent threshold and a standard displaced threshold is available for takeoff and for landing in the opposite direction, the temporary displaced threshold need not be located at an entrance/exit taxiway. See Figure 2-2.

2.7.1.2 Closing of aircraft rescue and fire fighting access routes.

2.7.1.3 Closing of access routes used by airport and airline support vehicles.

2.7.1.4 Interruption of utilities, including water supplies for fire fighting.

2.7.1.5 Approach/departure surfaces affected by heights of objects.

2.7.1.6 Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.

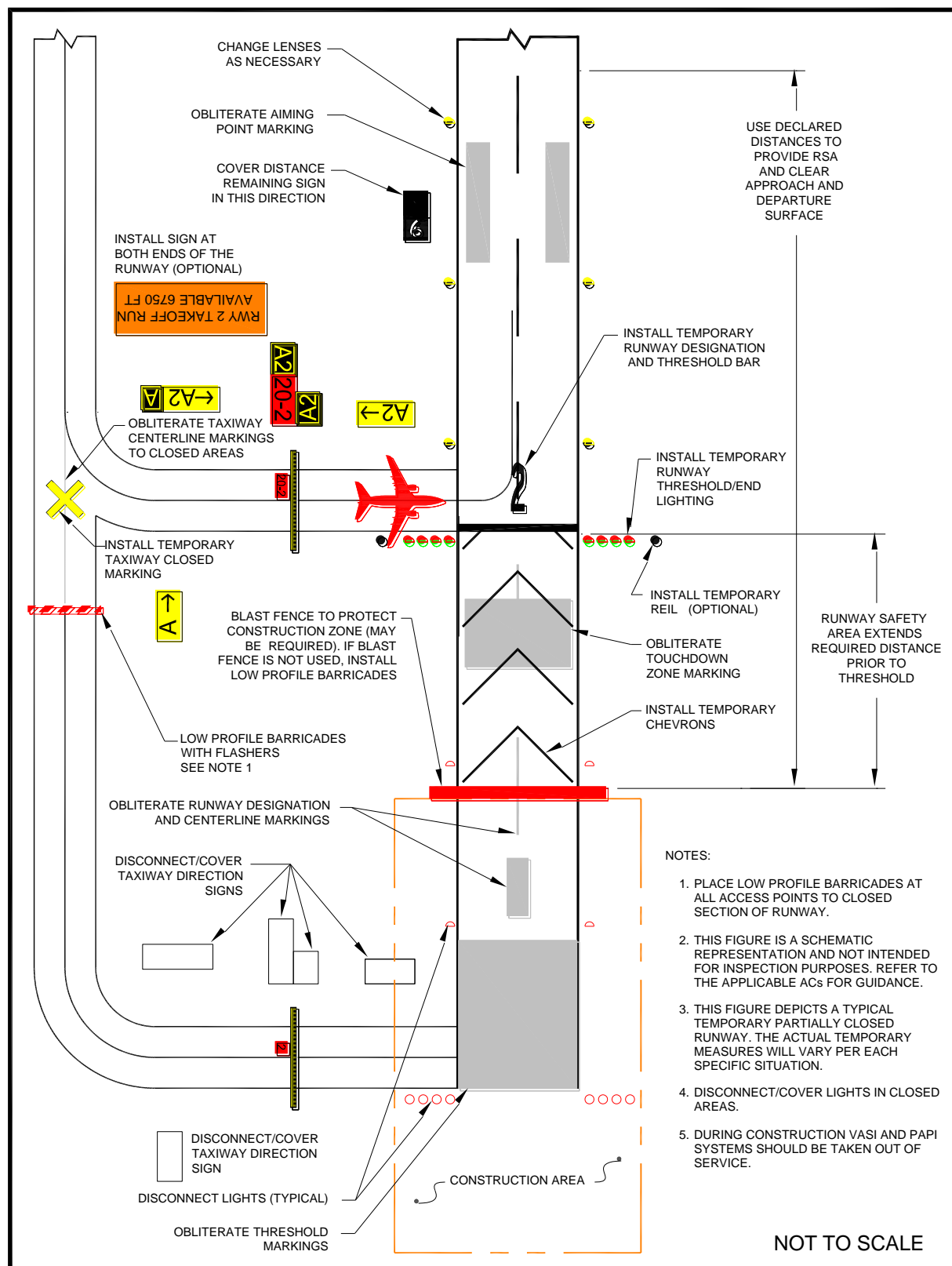
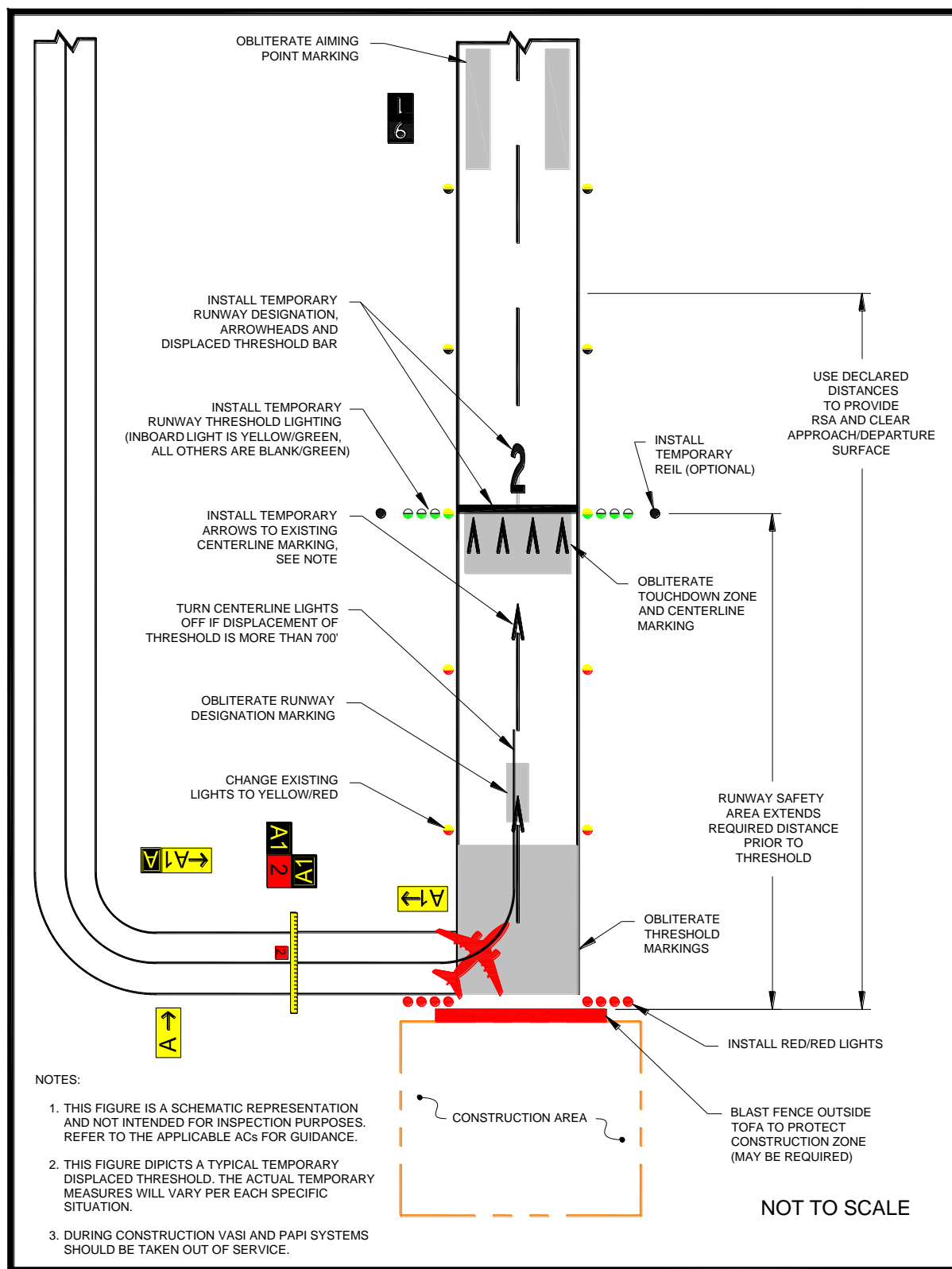
Figure 2-1. Temporary Partially Closed Runway

Figure 2-2. Temporary Displaced Threshold

Note: See paragraph 2.18.2.5.

2.7.2 Mitigation of Effects.

Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

- 2.7.2.1 Temporary changes to runway and/or taxi operations.
- 2.7.2.2 Detours for ARFF and other airport vehicles.
- 2.7.2.3 Maintenance of essential utilities.
- 2.7.2.4 Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

2.8 **Navigation Aid (NAVAID) Protection.**

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 2.13.5.3.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the “critical area” associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 2.13.2.). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 2.13.5.3.)

2.9 **Contractor Access.**

The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

2.9.1 Location of Stockpiled Construction Materials.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 2.18.2.) This includes determining and

verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material. See paragraphs 2.10 and 2.11.

2.9.2 Vehicle and Pedestrian Operations.

The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, with associated training requirements:

2.9.2.1 **Construction Site Parking.**

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

2.9.2.2 **Construction Equipment Parking.**

Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 2.13.1 for further information.

2.9.2.3 **Access and Haul Roads.**

Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul

roads does not interfere with NAVAIDs or approach surfaces of operational runways. Address whether access gates will be blocked or inoperative or if a rally point will be blocked or inaccessible.

- 2.9.2.4 Marking and lighting of vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*.
- 2.9.2.5 Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.
- 2.9.2.6 Required escorts.
- 2.9.2.7 **Training Requirements for Vehicle Drivers to Ensure Compliance with the Airport Operator's Vehicle Rules and Regulations.**

Specific training should be provided to vehicle operators, including those providing escorts. See AC 150/5210-20, *Ground Vehicle Operations on Airports*, for information on training and records maintenance requirements.
- 2.9.2.8 **Situational Awareness.**

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time. At non-towered airports, all aircraft movements and flight operations rely on aircraft operators to self-report their positions and intentions. However, there is no requirement for an aircraft to have radio communications. Because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.
- 2.9.2.9 **Two-Way Radio Communication Procedures.**
- 2.9.2.9.1 General.

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

 1. Airport operations
 2. ATCT

3. Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.
4. Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and “shortened” runways on the ATIS frequency.

2.9.2.9.2 Areas Requiring Two-Way Radio Communication with the ATCT.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

2.9.2.9.3 Frequencies to be Used.

The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

2.9.2.9.4 Proper radio usage, including read back requirements.

2.9.2.9.5 Proper phraseology, including the International Phonetic Alphabet.

2.9.2.9.6 Light Gun Signals.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard “Ground Vehicle Guide to Airport Signs and Markings.” This safety placard may be downloaded through the Runway Safety Program Web site at http://www.faa.gov/airports/runway_safety/publications/ (see “Signs & Markings Vehicle Dashboard Sticker”) or obtained from the FAA Airports Regional Office.

2.9.2.10 **Maintenance of the secured area of the airport, including:**

2.9.2.10.1 Fencing and Gates.

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit “piggybacking” behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-

00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

2.9.2.10.2 Badging Requirements.

Airports subject to 49 CFR Part 1542, *Airport Security*, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

2.10 **Wildlife Management.**

The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, and CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife*. Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

2.10.1 Trash.

Food scraps must be collected from construction personnel activity.

2.10.2 Standing Water.

2.10.3 Tall Grass and Seeds.

Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, *Standards for Specifying Construction of Airports*, Item T-901, Seeding. Contact the local office of the United States Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

2.10.4 Poorly Maintained Fencing and Gates.

See paragraph 2.9.2.10.1.

2.10.5 Disruption of Existing Wildlife Habitat.

While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

2.11 Foreign Object Debris (FOD) Management.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) or covers may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, *Foreign Object Debris (FOD) Management*.

2.12 Hazardous Materials (HAZMAT) Management.

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, *Management of Airport Industrial Waste*.

2.13 Notification of Construction Activities.

The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

2.13.1 List of Responsible Representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours.

2.13.2 NOTAMs.

Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must either enter the NOTAM into NOTAM Manager, or provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMs) for Airport Operators*, for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 2.7.1.1 about issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

2.13.3 Emergency notification procedures for medical, fire fighting, and police response.

2.13.4 Coordination with ARFF.

The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

1. The deactivation and subsequent reactivation of water lines or fire hydrants, or
2. The rerouting, blocking and restoration of emergency access routes, or
3. The use of hazardous materials on the airfield.

2.13.5 Notification to the FAA.

2.13.5.1 **Part 77.**

Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, other equipment) on airports. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix A to download the form. Further guidance is available on the FAA web site at oeaaa.faa.gov.

2.13.5.2 **Part 157.**

With some exceptions, Title 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, *Notice of Landing Area Proposal*, to the nearest FAA Airports Regional or District Office. See Appendix A to download the form.

2.13.5.3 **NAVAIDs.**

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

2.13.5.3.1 Airport Owned/FAA Maintained.

If construction operations require a shutdown of 24 hours or greater in duration, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown, using Strategic Event Coordination (SEC) Form 6000.26 contained within FAA Order 6000.15, *General Maintenance Handbook for National Airspace System (NAS) Facilities*.

2.13.5.3.2 FAA Owned.

1. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs, using SEC Form 6000.26.
2. Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. Refer to active Service Level Agreement with ATO for specifics.

2.14 **Inspection Requirements.**

2.14.1 Daily Inspections.

Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix D, Construction Project Daily Safety Inspection Checklist. See also AC 150/5200-18, Airport Safety Self-Inspection. Airport operators holding a Part 139 certificate are required to conduct self-inspections during unusual conditions, such as construction activities, that may affect safe air carrier operations.

2.14.2 Interim Inspections.

Inspections should be conducted of all areas to be (re)opened to aircraft traffic to ensure the proper operation of lights and signs, for correct markings, and absence of FOD. The contractor should conduct an inspection of the work area with airport operations personnel. The contractor should ensure that all construction materials have been secured, all pavement surfaces have been swept clean, all transition ramps have been properly constructed, and that surfaces have been appropriately marked for aircraft to operate safely. Only if all items on the list meet with the airport operator's approval should the air traffic control tower be notified to open the area to aircraft operations. The contractor should be required to retain a suitable workforce and the necessary equipment at the work area for any last minute cleanup that may be requested by the airport operator prior to opening the area.

2.14.3 Final Inspections.

New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

2.15 Underground Utilities.

The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that “One Call” or “Miss Utility” services do not include FAA ATO/Technical Operations.

2.16 Penalties.

The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

2.17 Special Conditions.

The CSPP must detail any special conditions that affect the operation of the airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

2.18 Runway and Taxiway Visual Aids.

This includes marking, lighting, signs, and visual NAVAIDs. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary. The CSPP must address the following, as appropriate:

2.18.1 General.

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, and other wind currents and constructed of materials that will minimize damage to an aircraft in the event of inadvertent contact. Items used to secure such markings must be of a color similar to the marking.

2.18.2 Markings.

During the course of construction projects, temporary pavement markings are often required to allow for aircraft operations during or between work periods. During the design phase of the project, the designer should coordinate with the project manager,

airport operations, airport users, the FAA Airports project manager, and Airport Certification Safety Inspector for Part 139 airports to determine minimum temporary markings. The FAA Airports project manager will, wherever a runway is closed, coordinate with the appropriate FAA Flight Standards Office and disseminate findings to all parties. Where possible, the temporary markings on finish grade pavements should be placed to mirror the dimensions of the final markings. Markings must be in compliance with the standards of AC 150/5340-1, *Standards for Airport Markings*, except as noted herein. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 2.18.2.1.2.)

2.18.2.1 Closed Runways and Taxiways.

2.18.2.1.1 Permanently Closed Runways.

For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place an X at each end and at 1,000-foot (300 m) intervals. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X.

2.18.2.1.2 Temporarily Closed Runways.

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X. See Figure 2-3. See also paragraph 2.18.3.3.

2.18.2.1.3 Partially Closed Runways and Displaced Thresholds.

When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 2.7.1.1 for the difference between partially closed runways and runways with displaced thresholds. Because of the temporary nature of threshold displacement due to construction, it is not necessary to re-adjust the existing runway centerline markings to meet standard spacing for a runway with a visual approach. Some of the requirements below may be waived in the cases of low-activity airports and/or short duration changes that are measured in days rather than weeks. Consider whether the presence of an airport traffic

control tower allows for the development of special procedures. Contact the appropriate FAA Airports Regional or District Office for assistance.

Figure 2-3. Markings for a Temporarily Closed Runway

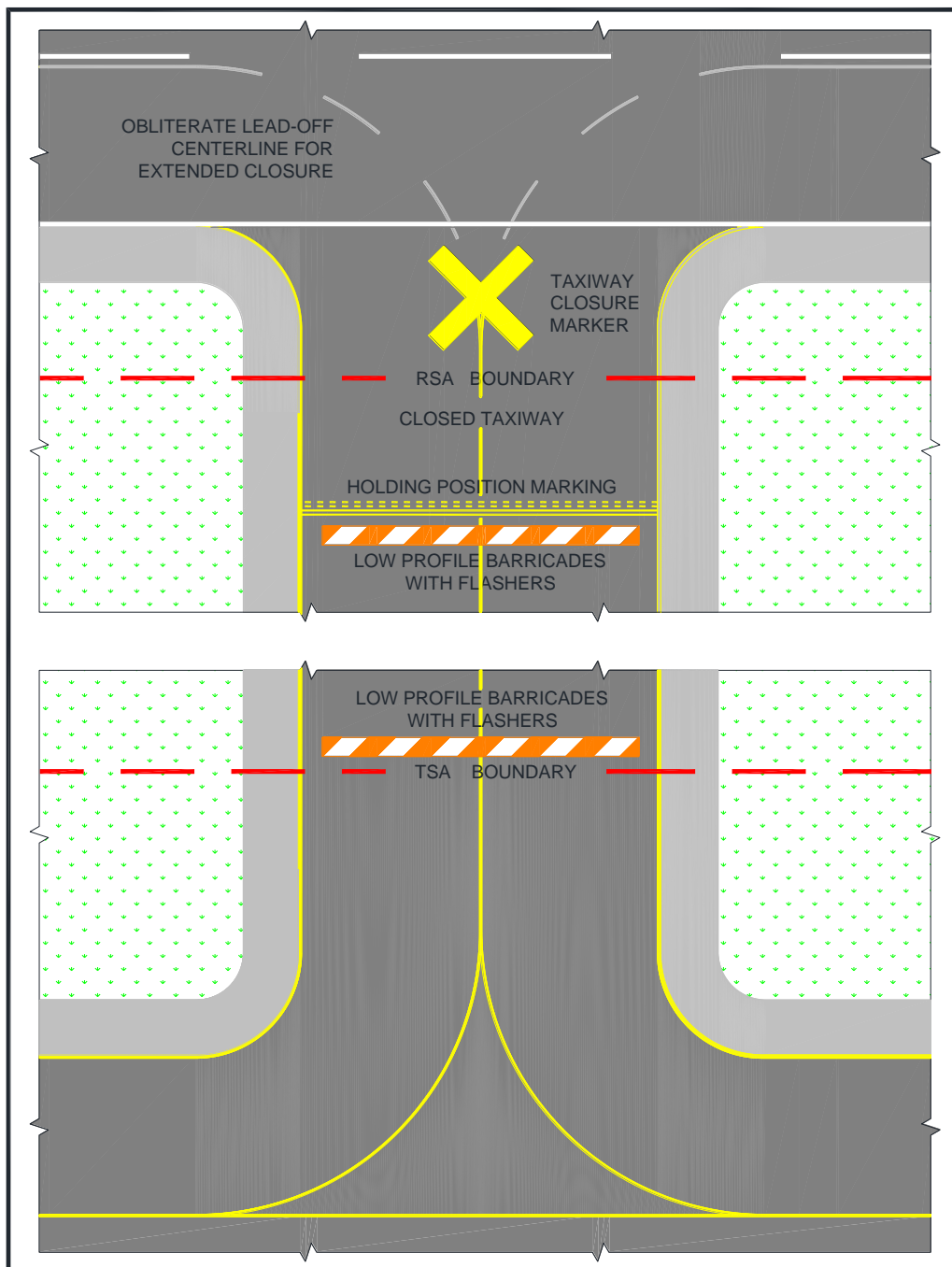


1. **Partially Closed Runways.** Pavement markings for temporary closed portions of the runway consist of a runway threshold bar, runway designation, and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see [AC 150/5340-1](#)). Obliterate or cover markings prior to the moved threshold. Existing touchdown zone markings beyond the moved threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See [Figure 2-4](#).
2. **Displaced Thresholds.** Pavement markings for a displaced threshold consist of a runway threshold bar, runway designation, and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See [AC 150/5340-1](#). Obliterate markings prior to the displaced threshold. Existing touchdown zone markings beyond the displaced threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See [Figure 2-2](#).

2.18.2.1.4 Taxiways.

1. **Permanently Closed Taxiways.** AC 150/5300-13 Airport Design, notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. See Figure 2-4.

Figure 2-4. Temporary Taxiway Closure



2. **Temporarily Closed Taxiways.** Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines and taxiway to taxiway turns, leading to the closed section. Always obliterate runway lead-off lines for high speed exits, regardless of the duration of the closure. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed. See Figure 2-4.

2.18.2.1.5 Temporarily Closed Airport.

When the airport is closed temporarily, mark all the runways as closed.

- 2.18.2.2 If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents. Items used to secure such markings must be of a color similar to the marking.

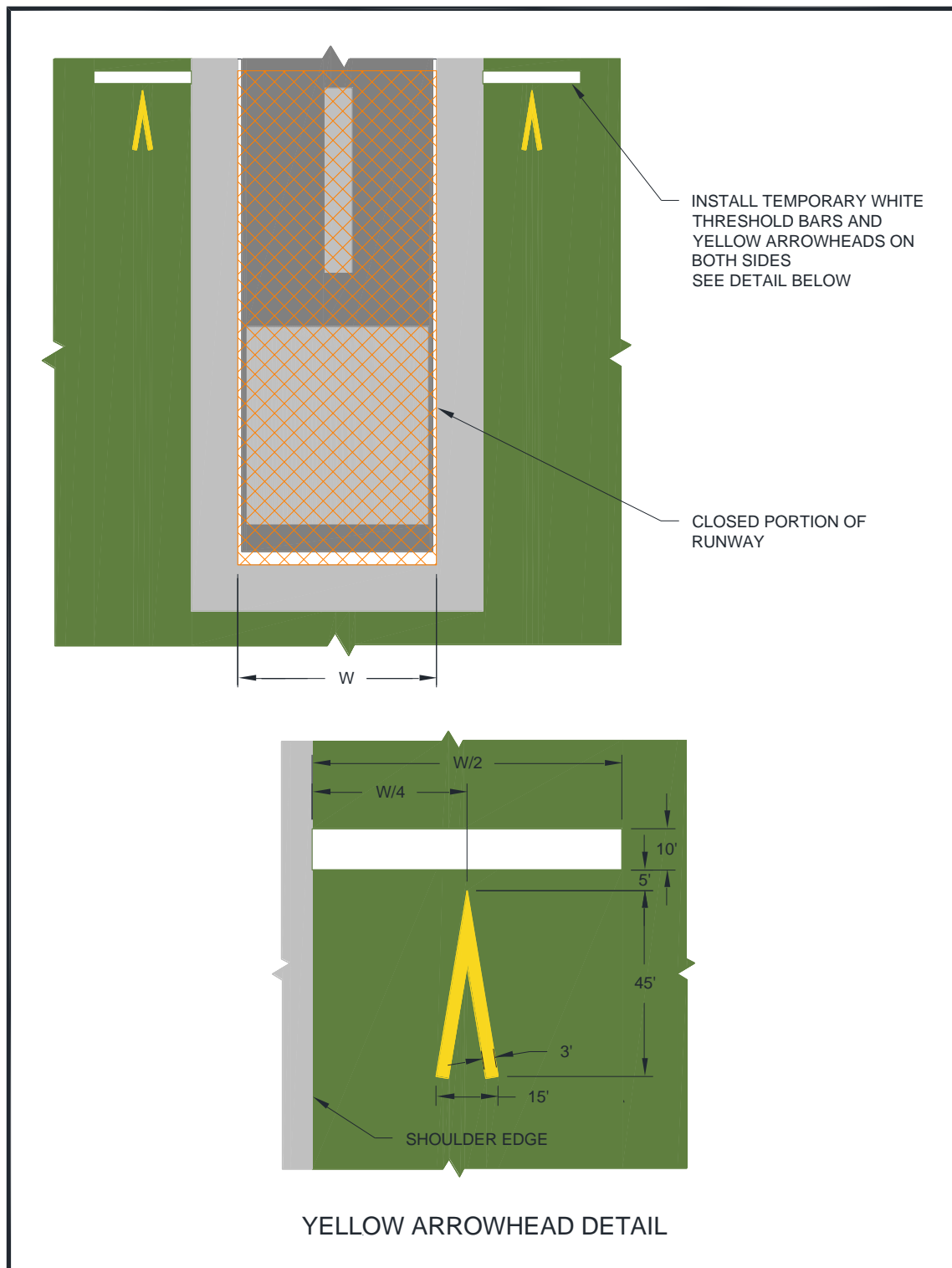
- 2.18.2.3 It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

- 2.18.2.4 If it is not possible to install threshold bars, chevrons, and arrows on the pavement, “temporary outboard white threshold bars and yellow arrowheads”, see Figure 2-5, may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimensions must be as shown in Figure 2-5. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

- 2.18.2.5 The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, “Runway and Taxiway Painting,” in AC 150/5370-10), but the dimensions must meet the existing standards. When applying temporary markings at night, it is recommended that the fast curing, Type II paint be used to help offset the higher humidity and cooler temperatures often experienced at night. Diluting the paint will substantially increase cure time and is not recommended. Glass beads are not recommended for temporary markings. Striated markings may also be used for certain temporary markings. AC

150/5340-1, Standards for Airport Markings, has additional guidance on temporary markings.

Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads



2.18.3 Lighting and Visual NAVAIDs.

This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting installation must be in conformance with AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*, and fixture design in conformance with AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights*. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. See AC 150/5340-26, *Maintenance of Airport Visual Aid Facilities*, for disconnect procedures and safety precautions. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Maintain mandatory hold signs to operate normally in any situation where pilots or vehicle drivers could mistakenly be in that location. At towered airports certificated under Part 139, holding position signs are required to be illuminated on open taxiways crossing to closed or inactive runways. If the holding position sign is installed on the runway circuit for the closed runway, install a jumper to the taxiway circuit to provide power to the holding position sign for nighttime operations. Where it is not possible to maintain power to signs that would normally be operational, install barricades to exclude aircraft. Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 illustrate temporary changes to lighting and visual NAVAIDs.

2.18.3.1 **Permanently Closed Runways and Taxiways.**

For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

2.18.3.2 **Temporarily Closed Runways and New Runways Not Yet Open to Air Traffic.**

If available, use a lighted X, both at night and during the day, placed at each end of the runway on or near the runway designation numbers facing the approach. (Note that the lighted X must be illuminated at all times that it is on a runway.) The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure*. For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-6 shows a lighted X by day. Figure 2-7 shows a lighted X at night.

Figure 2-6. Lighted X in Daytime**Figure 2-7. Lighted X at Night**

2.18.3.3 **Partially Closed Runways and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially

closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service.

2.18.3.3.1 Partially Closed Runways.

Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixtures in such a way as to prevent light leakage. See Figure 2-1.

2.18.3.3.2 Temporary Displaced Thresholds.

Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light (white for visual runways) in the opposite direction. If the displacement is 700 feet or less, blank out centerline lights in the direction of approach or place the centerline lights out of service. If the displacement is over 700 feet, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds. See Figure 2-2.

2.18.3.3.3 Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

2.18.3.3.4 A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 2.18.2.1.3. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, *Specification for L-853, Runway and Taxiway Retroreflective Markers*.

2.18.3.3.5 Temporary threshold lights and runway end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 inch (7.6 cm) above ground. (The standard above ground height for airport lighting fixtures is 14 inches (35 cm)). When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

2.18.3.3.6 Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may

be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

- 2.18.3.3.7 When runway thresholds are temporarily displaced, reconfigure yellow lenses (caution zone), as necessary, and place the centerline lights out of service.
- 2.18.3.3.8 Relocate the Visual Glide Slope Indicator (VGSI), such as Visual Approach Slope Indicator (VASI) and Precision Approach Path Indicator (PAPI); other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense. See FAA JO 6850.2, *Visual Guidance Lighting Systems*, for installation criteria for FAA owned and operated NAVAIDs.
- 2.18.3.3.9 Issue a NOTAM to inform pilots of temporary lighting conditions.
- 2.18.3.4 **Temporarily Closed Taxiways.**
If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open), cover the light fixture in a way as to prevent light leakage.

2.18.4 Signs.

To the extent possible, signs must be in conformance with AC 150/5345-44, *Specification for Runway and Taxiway Signs*, and AC 150/5340-18, *Standard for Airport Sign Systems*.

2.18.4.1 **Existing Signs.**

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function or would provide conflicting information, it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

2.18.4.2 Temporary Signs.

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot “information overload,” the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. Temporary signs must meet the standards for such signs in Engineering Brief 93, *Guidance for the Assembly and Installation of Temporary Orange Construction Signs*. Many criteria in AC 150/5345-44, *Specification for Runway and Taxiway Signs*, are referenced in the Engineering Brief. Permissible sign legends are:

1. CONSTRUCTION AHEAD,
2. CONSTRUCTION ON RAMP, and
3. RWY XX TAKEOFF RUN AVAILABLE XXX FT.

Phasing, supported by drawings and sign schedule, for the installation of orange construction signs must be included in the CSPP or SPCD.

2.18.4.2.1 Takeoff Run Available (TORA) signs.

Recommended: Where a runway has been shortened for takeoff, install orange TORA signs well before the hold lines, such as on a parallel taxiway prior to a turn to a runway hold position. See EB 93 for sign size and location.

2.18.4.2.2 Sign legends are shown in Figure F-1.

Note: See Figure E-1, Figure E-2, Figure E-3, Figure F-2, and Figure F-3 for examples of orange construction sign locations.

2.19 Marking and Signs for Access Routes.

The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, *Frangible Connections*, which may require modification to size and height guidance in the MUTCD.

2.20 **Hazard Marking, Lighting and Signing.**

2.20.1 Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft, and prevent construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

2.20.2 Equipment.

2.20.2.1 **Barricades.**

Low profile barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude aircraft, gaps between barricades must be smaller than the wingspan of the smallest aircraft to be excluded; if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 feet (1.2 meters). Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

2.20.2.2 **Lights.**

Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 feet (3 meters). Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

2.20.2.3 **Supplement Barricades with Signs (for example) As Necessary.**

Examples are “No Entry” and “No Vehicles.” Be aware of the increased effects of wind and jet blast on barricades with attached signs.

2.20.2.4 **Air Operations Area – General.**

Barricades are not permitted in any active safety area or on the runway side of a runway hold line. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, highly reflective collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 inch (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, and other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inch (7.6 cm) above the ground. Figure 2-8 and Figure 2-9 show sample barricades with proper coloring and flags.

Figure 2-8. Interlocking Barricades



Figure 2-9. Low Profile Barricades**2.20.2.5 Air Operations Area – Runway/Taxiway Intersections.**

Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

2.20.2.6 Air Operations Area – Other.

Beyond runway and taxiway object free areas and aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

2.20.2.7 Maintenance.

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

2.21 Work Zone Lighting for Nighttime Construction.

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to [AC 150/5370-10](#) for minimum illumination levels for nighttime paving projects. Additionally, it is recommended that all support equipment, except haul trucks, be equipped with artificial illumination to safely

illuminate the area immediately surrounding their work areas. The lights should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers should be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Shielding may be necessary. Light towers should be removed from the construction site when the area is reopened to aircraft operations. Construction lighting units should be identified and generally located on the construction phasing plans in relationship to the ATCT and active runways and taxiways.

2.22 **Protection of Runway and Taxiway Safety Areas.**

Runway and taxiway safety areas, OFZs, OFAs, and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (see paragraph 2.13.5) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

2.22.1 Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

- 2.22.1.1 No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (See AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published, and appropriate NOTAMs issued. See AC 150/5300-13 for guidance on the use of declared distances.
- 2.22.1.2 The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.
- 2.22.1.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

2.22.1.4 Excavations.

2.22.1.4.1 Open trenches or excavations are not permitted within the RSA while the runway is open. Backfill trenches before the runway is opened. If backfilling excavations before the runway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

2.22.1.4.2 Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.1.5 Erosion Control.

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.2 Runway Object Free Area (ROFA).

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

2.22.3 Taxiway Safety Area (TSA).

2.22.3.1 A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Since the width of the TSA is equal to the wingspan of the design aircraft, no construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction. Give special consideration to TSA dimensions at taxiway turns and intersections. (see AC 150/5300-13).

2.22.3.2 The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

2.22.3.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

2.22.3.4 **Excavations.**

1. Curves. Open trenches or excavations are not permitted within the TSA while the taxiway is open. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
2. Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for unrestricted aircraft operations. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations to allow the safe passage of ARFF equipment and of the heaviest aircraft operating on the taxiway across the trench without causing damage to the equipment or aircraft. In rare circumstances where the section of taxiway is indispensable for aircraft movement, open trenches or excavations may be permitted in the TSA while the taxiway is open to aircraft operations, subject to the following restrictions:
 - a. Taxiing speed is limited to 10 mph.
 - b. Appropriate NOTAMs are issued.
 - c. Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
 - d. Low mass, low-profile lighted barricades are installed.
 - e. Appropriate temporary orange construction signs are installed.
3. Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.3.5 **Erosion control.**

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.4 Taxiway Object Free Area (TOFA).

Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus, the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

- 2.22.4.1 The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available. Give special consideration to TOFA dimensions at taxiway turns and intersections.
- 2.22.4.2 Offset taxiway centerline and edge pavement markings (do not use glass beads) may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting, centerline reflectors, or taxiway edge reflectors are required. Existing lighting that does not coincide with the temporary markings must be taken out of service.
- 2.22.4.3 Construction activity, including open excavations, may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:
 - 2.22.4.3.1 Taxiing speed is limited to 10 mph.
 - 2.22.4.3.2 NOTAMs issued advising taxiing pilots of hazard and recommending reduced taxiing speeds on the taxiway.
 - 2.22.4.3.3 Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
 - 2.22.4.3.4 If desired, appropriate orange construction signs are installed. See paragraph 2.18.4.2 and Appendix F.
 - 2.22.4.3.5 Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the usable pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.
 - 2.22.4.3.6 Flaggers furnished by the contractor must be used to direct and control construction equipment and personnel to a pre-established setback distance for safe passage of aircraft, and airline and/or airport personnel. Flaggers must also be used to direct taxiing aircraft. Due to liability issues, the airport operator should require airlines to provide flaggers for directing taxiing aircraft.

2.22.5 Obstacle Free Zone (OFZ).

In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6 Runway Approach/Departure Areas and Clearways.

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6.1 Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

2.22.6.2 **Caution About Partial Runway Closures.**

When filing a NOTAM for a partial runway closure, clearly state that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

2.22.6.3 **Caution About Displaced Thresholds.**

Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, or other work within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

2.23 **Other Limitations on Construction.**

The CSPP must specify any other limitations on construction, including but not limited to:

2.23.1 Prohibitions.

- 2.23.1.1 No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.
- 2.23.1.2 No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.
- 2.23.1.3 No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property. See AC 150/5370-10.

2.23.2 Restrictions.

- 2.23.2.1 Construction suspension required during specific airport operations.
- 2.23.2.2 Areas that cannot be worked on simultaneously.
- 2.23.2.3 Day or night construction restrictions.
- 2.23.2.4 Seasonal construction restrictions.
- 2.23.2.5 Temporary signs not approved by the airport operator.
- 2.23.2.6 Grades changes that could result in unplanned effects on NAVAIDs.

CHAPTER 3. GUIDELINES FOR WRITING A CSPP

3.1 General Requirements.

The CSPP is a standalone document written to correspond with the subjects outlined in paragraph 2.4. The CSPP is organized by numbered sections corresponding to each subject listed in paragraph 2.4, and described in detail in paragraphs 2.5 - 2.23. Each section number and title in the CSPP matches the corresponding subject outlined in paragraph 2.4 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

3.2 Applicability of Subjects.

Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA ILS cables during trenching operations could be considered FAA ATO coordination (Coordination, paragraph 2.5.3), an area and operation affected by the construction activity (Areas and Operations Affected by the Construction Activity, paragraph 2.7.1.4), a protection of a NAVAID (Protection of Navigational Aids (NAVAIDs), paragraph 2.8), or a notification to the FAA of construction activities (Notification of Construction Activities, paragraph 2.13.5.3.2). However, it is more specifically an underground utility requirement (Underground Utilities, paragraph 2.15). The procedure for protecting underground ILS cables during trenching operations should therefore be described in 2.4.2.11: “The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings.” All other applicable sections should include a reference to 2.4.2.11: “ILS cables shall be identified and protected as described in 2.4.2.11” or “See 2.4.2.11 for ILS cable identification and protection requirements.” Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

3.3 Graphical Representations.

Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

3.4 **Reference Documents.**

The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor. Where this AC recommends references (e.g. as in paragraph 3.9) the intent is to include a reference to the corresponding section in the CSPP, not to this Advisory Circular.

3.5 **Restrictions.**

The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent (“as-built”) features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

3.6 **Coordination.**

Include in this section a detailed description of conferences and meetings to be held both before and during the project. Include appropriate information from AC 150/5370-12. Discuss coordination procedures and schedules for each required FAA ATO Technical Operations shutdown and restart and all required flight inspections.

3.7 **Phasing.**

Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 3.8, as appropriate.

3.8 **Areas and Operations Affected by Construction.**

Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. See Appendix F for sample operational effects tables and figures.

3.9 **NAVAID Protection.**

List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 3.6 for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 3.14 for the

issuance of NOTAMs as required. Include a reference to paragraph 3.16 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 3.19. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

3.10 **Contractor Access.**

This will necessarily be the most extensive section of the CSPP. Provide sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

3.10.1 Location of Stockpiled Construction Materials.

Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 3.11 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 3.12 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

3.10.2 Vehicle and Pedestrian Operations.

While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying HAZMAT vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

3.10.3 Two-Way Radio Communications.

Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor CTAF at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light

signals, telephone numbers, others) must be included. All radio frequencies should be identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

3.10.4 **Airport Security.**

Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

3.11 **Wildlife Management.**

Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 3.10 for security (wildlife) fence integrity maintenance as required.

3.12 **FOD Management.**

In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 3.15 for inspection requirements as required.

3.13 **HAZMAT Management.**

Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be identified. Include a reference to paragraph 3.10 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

3.14 **Notification of Construction Activities.**

List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to

Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. Identify the E911 address of the airport and the emergency access route via haul roads to the construction site. Require the contractor to have this information available to all workers. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 3.10. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

3.15 Inspection Requirements.

Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) or other airport operator's representative and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

3.16 Underground Utilities.

Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 3.14 for notification of utility owners of accidental utility disruption as required.

3.17 Penalties.

Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, VPD, and others.

3.18 Special Conditions.

Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 3.10 for compliance with airport safety and security measures and for radio communications as required. Include

a reference to paragraph 3.14 for emergency notification of all involved parties, including police/security, ARFF, and medical services.

3.19 Runway and Taxiway Visual Aids.

Include marking, lighting, signs, and visual NAVAIDS. Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDS required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDS that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDS such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, Standards for Airport Markings; AC 150/5340-18, Standards for Airport Sign Systems; and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDS.

3.20 Marking and Signs for Access Routes.

Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration MUTCD and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

3.21 Hazard Marking and Lighting.

Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 3.14. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

3.22 Work Zone Lighting for Nighttime Construction.

If work is to be conducted at night, specify all lighting equipment, including when and where each type of device is to be used. Indicate the direction lights are to be aimed and any directions that aiming of lights is prohibited. Specify any shielding necessary in instances where aiming is not sufficient to prevent interference with air traffic control and aircraft operations. Attach drawings to graphically indicate the placement and aiming of lighting equipment. Where the plan only indicates directions that aiming of lights is prohibited, the placement and positioning of portable lights must be proposed by the Contractor and approved by the airport operator's representative each time lights are relocated or repositioned.

3.23 Protection of Runway and Taxiway Safety Areas.

This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13, as required. Include a reference to paragraph 3.10 for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 3.10 for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide the required Runway Safety Area, include a reference to paragraphs 3.14 and 3.19. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13, as required. Include a reference to paragraph 3.24 for height (i.e., crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional “box” within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

3.24 Other Limitations on Construction.

This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e., crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 3.7 for project phasing requirements based on construction limitations as required.

Page Intentionally Blank

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
<u>AC 150/5200-28</u>	<i>Notices to Airmen (NOTAMs) for Airport Operators</i> Guidance for using the NOTAM System in airport reporting.
<u>AC 150/5200-30</u>	<i>Airport Field Condition Assessments and Winter Operations Safety</i> Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
<u>AC 150/5200-33</u>	<i>Hazardous Wildlife Attractants On or Near Airports</i> Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports.
<u>AC 150/5210-5</u>	<i>Painting, Marking, and Lighting of Vehicles Used on an Airport</i> Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
<u>AC 150/5210-20</u>	<i>Ground Vehicle Operations to include Taxiing or Towing an Aircraft on Airports</i> Guidance to airport operators on developing ground vehicle operation training programs.
<u>AC 150/5300-13</u>	<i>Airport Design</i> 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.
<u>AC 150/5210-24</u>	<i>Airport Foreign Object Debris (FOD) Management</i> Guidance for developing and managing an airport foreign object debris (FOD) program

Number	Title and Description
<u>AC 150/5320-15</u>	<p><i>Management of Airport Industrial Waste</i></p> <p>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.</p>
<u>AC 150/5340-1</u>	<p><i>Standards for Airport Markings</i></p> <p>FAA standards for the siting and installation of signs on airport runways and taxiways.</p>
<u>AC 150/5340-18</u>	<p><i>Standards for Airport Sign Systems</i></p> <p>FAA standards for the siting and installation of signs on airport runways and taxiways.</p>
<u>AC 150/5345-28</u>	<p><i>Precision Approach Path Indicator (PAPI) Systems</i></p> <p>FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.</p>
<u>AC 150/5340-30</u>	<p><i>Design and Installation Details for Airport Visual Aids</i></p> <p>Guidance and recommendations on the installation of airport visual aids.</p>
<u>AC 150/5345-39</u>	<p><i>Specification for L-853, Runway and Taxiway Retroreflective Markers</i></p>
<u>AC 150/5345-44</u>	<p><i>Specification for Runway and Taxiway Signs</i></p> <p>FAA specifications for unlighted and lighted signs for taxiways and runways.</p>
<u>AC 150/5345-53</u>	<p><i>Airport Lighting Equipment Certification Program</i></p> <p>Details on the Airport Lighting Equipment Certification Program (ALECP).</p>
<u>AC 150/5345-50</u>	<p><i>Specification for Portable Runway and Taxiway Lights</i></p> <p>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.</p>
<u>AC 150/5345-55</u>	<p><i>Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure</i></p>

Number	Title and Description
<u>AC 150/5370-10</u>	<i>Standards for Specifying Construction of Airports</i> Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
<u>AC 150/5370-12</u>	<i>Quality Management for Federally Funded Airport Construction Projects</i>
EB 93	<i>Guidance for the Assembly and Installation of Temporary Orange Construction Signs</i>
FAA Order 5200.11	<u>FAA Airports (ARP) Safety Management System (SMS)</u> 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	<i>Grasses Attractive to Hazardous Wildlife</i> Guidance on grass management and seed selection.
FAA Form 7460-1	<u>Notice of Proposed Construction or Alteration</u>
FAA Form 7480-1	<u>Notice of Landing Area Proposal</u>
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/>.

Page Intentionally Blank

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, <i>Safe, Efficient Use, and Preservation of the Navigable Airspace</i> . (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, <i>Certification of Airports</i> .
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 <u>AC 150/5300-13</u> 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 <u>AC 150/5300-13</u> 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 <u>AC 150/5300-13</u> .
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 <u>AC 150/5300-13</u> .
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 <u>AC 150/5300-13</u> for guidance on declared distances.
TSA	Taxiway Safety Area, or Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicator
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI), visual approach slope indicator (VASI), and pulse light approach slope indicator (PLASI).
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not a required submittal.

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	<u>2.5</u>				
Operational safety is a standing agenda item for construction progress meetings.	<u>2.5</u>				
Scheduling of the construction phases is properly addressed.	<u>2.6</u>				
Any formal agreements are established.	<u>2.5.3</u>				
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	<u>2.7.1</u>				
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	<u>2.7.1.1</u>				
Access routes used by ARFF vehicles affected by the project are addressed.	<u>2.7.1.2</u>				
Access routes used by airport and airline support vehicles affected by the project are addressed.	<u>2.7.1.3</u>				
Underground utilities, including water supplies for firefighting and drainage.	<u>2.7.1.4</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	<u>2.7.1.5</u>				
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	<u>2.7.1</u>				
Temporary changes to taxi operations are addressed.	<u>2.7.2.1</u>				
Detours for ARFF and other airport vehicles are identified.	<u>2.7.2.2</u>				
Maintenance of essential utilities and underground infrastructure is addressed.	<u>2.7.2.3</u>				
Temporary changes to air traffic control procedures are addressed.	<u>2.7.2.4</u>				
NAVAIDs					
Critical areas for NAVAIDs are depicted on drawings.	<u>2.8</u>				
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	<u>2.8</u>				
Protection of NAVAID facilities is addressed.	<u>2.8</u>				
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	<u>2.8</u>				
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	<u>2.8, 2.13.1, 2.13.5.3.1, 2.18.1</u>				
Contractor Access					
The CSPP addresses areas to which contractor will have access and how	<u>2.9</u>				

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.	<u>2.9</u>				
The location of stockpiled construction materials is depicted on drawings.	<u>2.9.1</u>				
The requirement for stockpiles in the ROFA to be approved by FAA is included.	<u>2.9.1</u>				
Requirements for proper stockpiling of materials are included.	<u>2.9.1</u>				
Construction site parking is addressed.	<u>2.9.2.1</u>				
Construction equipment parking is addressed.	<u>2.9.2.2</u>				
Access and haul roads are addressed.	<u>2.9.2.3</u>				
A requirement for marking and lighting of vehicles to comply with <u>AC 150/5210-5, Painting, Marking and Lighting of Vehicles Used on an Airport</u> , is included.	<u>2.9.2.4</u>				
Proper vehicle operations, including requirements for escorts, are described.	<u>2.9.2.5, 2.9.2.6</u>				
Training requirements for vehicle drivers are addressed.	<u>2.9.2.7</u>				
Two-way radio communications procedures are described.	<u>2.9.2.9</u>				
Maintenance of the secured area of the airport is addressed.	<u>2.9.2.10</u>				
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	<u>2.10</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign Object Debris Management					
The airport operator’s FOD management procedures are addressed.	<u>2.11</u>				
Hazardous Materials Management					
The airport operator’s hazardous materials management procedures are addressed.	<u>2.12</u>				
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.	<u>2.13</u>				
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.	<u>2.13.1</u>				
A list of local ATO/Technical Operations personnel is included.	<u>2.13.1</u>				
A list of ATCT managers on duty is included.	<u>2.13.1</u>				
A list of authorized representatives to the OCC is included.	<u>2.13.2</u>				
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	<u>2.8, 2.13.2, 2.18.3.3.9</u>				
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	<u>2.13.2</u>				
Emergency notification procedures for medical, fire fighting, and police	<u>2.13.3</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	<u>2.13.4</u>				
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	<u>2.13.5</u>				
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	<u>2.13.5.3.2</u>				
Inspection Requirements					
Daily and interim inspections by both the airport operator and contractor are specified.	<u>2.14.1, 2.14.2</u>				
Final inspections at certificated airports are specified when required.	<u>2.14.3</u>				
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	<u>2.15</u>				
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	<u>2.16</u>				
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	<u>2.17</u>				
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.	<u>2.18.1</u>				
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	<u>2.18.1, 2.18.3, 2.18.4.2, 2.20.2.4</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
The requirement for markings to be in compliance with <u>AC 150/5340-1</u> , <i>Standards for Airport Markings</i> , is specified.	<u>2.18.2</u>				
Detailed specifications for materials and methods for temporary markings are provided.	<u>2.18.2</u>				
The requirement for lighting to conform to <u>AC 150/5340-30</u> , <i>Design and Installation Details for Airport Visual Aids</i> ; <u>AC 150/5345-50</u> , <i>Specification for Portable Runway and Taxiway Lights</i> ; and <u>AC 150/5345-53</u> , <i>Airport Lighting Certification Program</i> , is specified.	<u>2.18.3</u>				
The use of a lighted X is specified where appropriate.	<u>2.18.2.1.2</u> , <u>2.18.3.2</u>				
The requirement for signs to conform to <u>AC 150/5345-44</u> , <i>Specification for Runway and Taxiway Signs</i> ; <u>AC 150/5340-18</u> , <i>Standards for Airport Sign Systems</i> ; and <u>AC 150/5345-53</u> , <i>Airport Lighting Certification Program</i> , is specified.	<u>2.18.4</u>				
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to <u>AC 150/5340-18</u> and, to the extent practicable, with the MUTCD and/or State highway specifications.	<u>2.18.4.2</u>				
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.	<u>2.20.1</u>				

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.	<u>2.20.1</u>				
The CSPP considers less obvious construction-related hazards.	<u>2.20.1</u>				
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.	<u>2.20.2.1</u>				
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	<u>2.20.2.1</u>				
Red lights meeting the luminance requirements of the State Highway Department are specified.	<u>2.20.2.2</u>				
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.	<u>2.20.2.3</u>				
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	<u>2.20.2.3</u>				
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	<u>2.20.2.5</u>				
Markings for temporary closures are specified.	<u>2.20.2.5</u>				
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	<u>2.20.2.7</u>				

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.	<u>2.21</u>				
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.	<u>2.22.1.1,</u> <u>2.22.3.1</u>				
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.	<u>2.22.1.2,</u> <u>2.22.3.2</u>				
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	<u>2.22.3.3</u>				
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.	<u>2.22.1.4</u>				
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	<u>2.22.1.4</u>				
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	<u>2.22.1.4</u>				
Grading and soil erosion control to maintain RSA/TSA standards are	<u>2.22.3.5</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	<u>2.22.2</u>				
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	<u>2.22.3</u>				
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	<u>2.22.4</u>				
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.	<u>2.22.4.3.6</u>				
Provisions for protection of runway approach/departure areas and clearways are included.	<u>2.22.6</u>				
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.	<u>2.23.1.2</u>				
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	<u>2.23.1.3</u>				

APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

Table D-1. Potentially Hazardous Conditions

Item	Action Required (Describe)	No Action Required (Check)
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.		
Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends.		
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.		
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.		
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and		

Item	Action Required (Describe)	No Action Required (Check)
approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.		
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Obliterated or faded temporary markings on active operational areas.		
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		

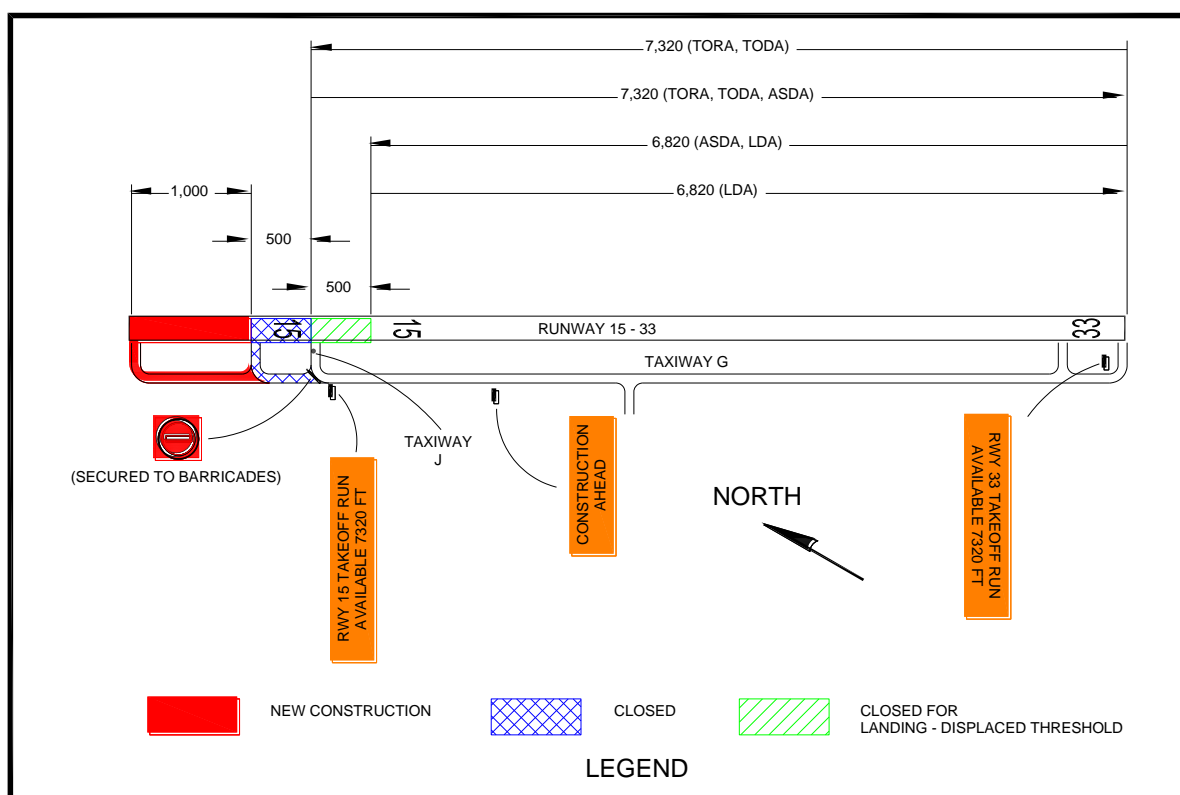
Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Lack of radio communications with construction vehicles in airport movement areas.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

Item	Action Required (Describe)	No Action Required (Check)
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Site burning, which can cause possible obscuration.		
Construction work taking place outside of designated work areas and out of phase.		

APPENDIX E. SAMPLE OPERATIONAL EFFECTS TABLE**E.1 Project Description.**

Runway 15-33 is currently 7820 feet long, with a 500 foot stopway on the north end. This project will remove the stopway and extend the runway 1000 feet to the north and 500 feet to the south. Finally, the existing portion of the runway will be repaved. The runway 33 glide slope will be relocated. The new runway 33 localizer has already been installed by FAA Technical Operations and only needs to be switched on. Runway 15 is currently served only by a localizer, which will remain in operation as it will be beyond the future RSA. Appropriate NOTAMS will be issued throughout the project.

- E.1.1 During Phase I, the runway 15 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 15 takeoff and the departure end of runway 33 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 33 will be adjusted to provide the required RSA and applicable departure surface. Excavation near Taxiway G will require its ADG to be reduced from IV to III. See [Figure E-1](#).

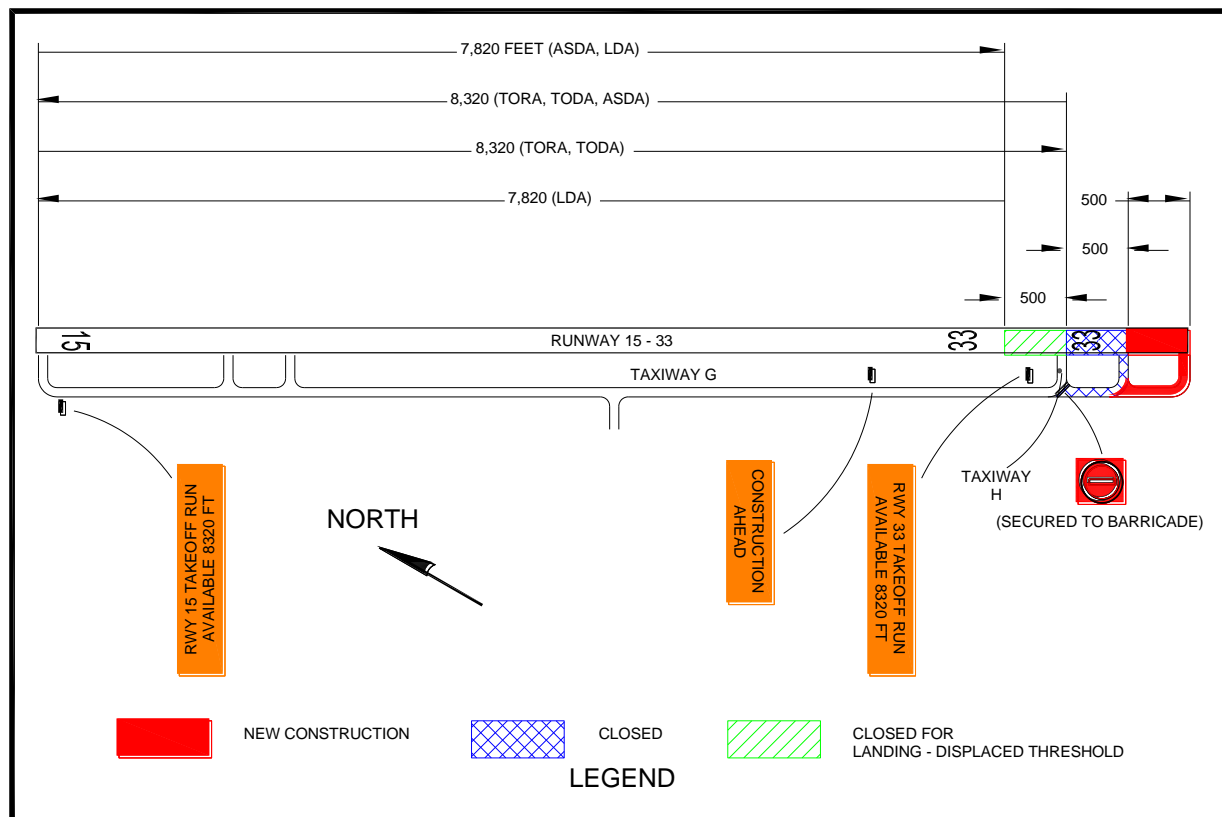
Figure E-1. Phase I Example

Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 33 departures, the maximum equipment height in the construction area is 12.5 feet ($500/40 = 12.5$).

- E.2 During Phase II, the runway 33 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 33 takeoff and the departure end of runway 15 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 15 will be adjusted to provide the required RSA and applicable departure surface. See [Figure E-2](#).

Figure E-2. Phase II Example



Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 15 departures, the maximum equipment height in the construction area is 12.5 feet ($500/40 = 12.5$).

- E.3 During Phase III, the existing portion of the runway will be repaved with Hot Mix Asphalt (HMA) and the runway 33 glide slope will be relocated. Construction will be accomplished between the hours of 8:00 pm and 5:00 am, during which the runway will be closed to operations.

Figure E-3. Phase III Example

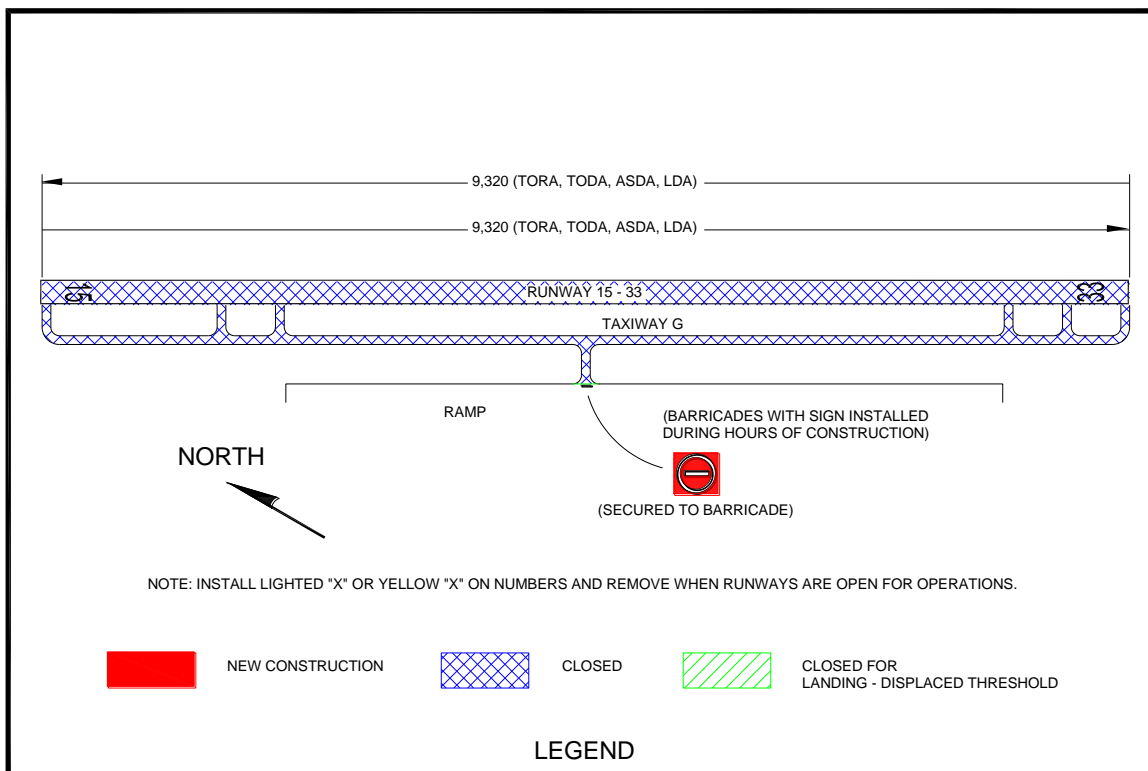


Table E-1. Operational Effects Table

Project	Runway 15-33 Extension and Repaving			
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Scope of Work	N/A	Extend Runway 15-33 1,000 ft on north end with Hot Mix Asphaltic Concrete (HMA).	Extend Runway 15-33 500 ft on south end with Hot Mix Asphaltic Concrete (HMA).	Repave existing runway with HMA Relocate Runway 33 Glide Slope
Effects of Construction Operations	N/A	Existing North 500 ft closed	Existing South 500 ft closed	Runway closed between 8:00 pm and 5:00 am Edge lighting out of service
Construction Phase	N/A	Phase I (Anticipated)	Phase II (Anticipated)	Phase III (Anticipated)
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 40 /day GA: 26 /day Military: 0 /day	Carrier: 45 /day GA: 26 /day Military: 5 /day	Carrier: 45 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 30 /day GA: 18 /day Military: 0 /day	Carrier: 25 /day GA: 18 /day Military: 5 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 Aircraft Category	C-IV	C-IV	C-IV	C-IV
Runway 15 Approach Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Runway 33 Approach Visibility Minimums	$\frac{3}{4}$ mile	$\frac{3}{4}$ mile	$\frac{3}{4}$ mile	1 mile

Note: Proper coordination with Flight Procedures group is necessary to maintain instrument approach procedures during construction.

Project		Runway 15-33 Extension and Repaving			
Phase		Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Runway 15 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	7,820	7,320	7,820	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 33 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	8,320	6,820	8,320	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 15 Approach Procedures		LOC only	LOC only	LOC only	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 33 Approach Procedures		ILS	ILS	ILS	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 15 NAVAIDs		LOC	LOC	LOC	LOC
Runway 33 NAVAIDs		ILS, MALSR	ILS, MALSR	ILS, MALSR	LOC, MALSR
Taxiway G ADG		IV	III	IV	IV
Taxiway G TDG		4	4	4	4
ATCT (hours open)		24 hours	24 hours	24 hours	0500 - 2000
ARFF Index		D	D	D	D

Project	Runway 15-33 Extension and Repaving			
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Special Conditions	Air National Guard (ANG) military operations	All military aircraft relocated to alternate ANG Base	Some large military aircraft relocated to alternate ANG Base	All military aircraft relocated to alternate ANG Base
Information for NOTAMs		Refer above for applicable declared distances. Taxiway G limited to 118 ft wingspan	Refer above for applicable declared distances.	Refer above for applicable declared distances. Airport closed 2000 – 0500. Runway 15 glide slope OTS.

Note: This table is one example. It may be advantageous to develop a separate table for each project phase and/or to address the operational status of the associated NAVAIDs per construction phase.

Complete the following chart for each phase to determine the area that must be protected along the runway and taxiway edges:

Table E-2. Runway and Taxiway Edge Protection

Runway/Taxiway	Aircraft Approach Category* A, B, C, or D	Airplane Design Group* I, II, III, or IV	Safety Area Width in Feet Divided by 2*

*See AC 150/5300-13 to complete the chart for a specific runway/taxiway.

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Table E-3. Protection Prior to Runway Threshold

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Distance to Threshold Based on Required Approach Slope*	
				ft	: 1
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1

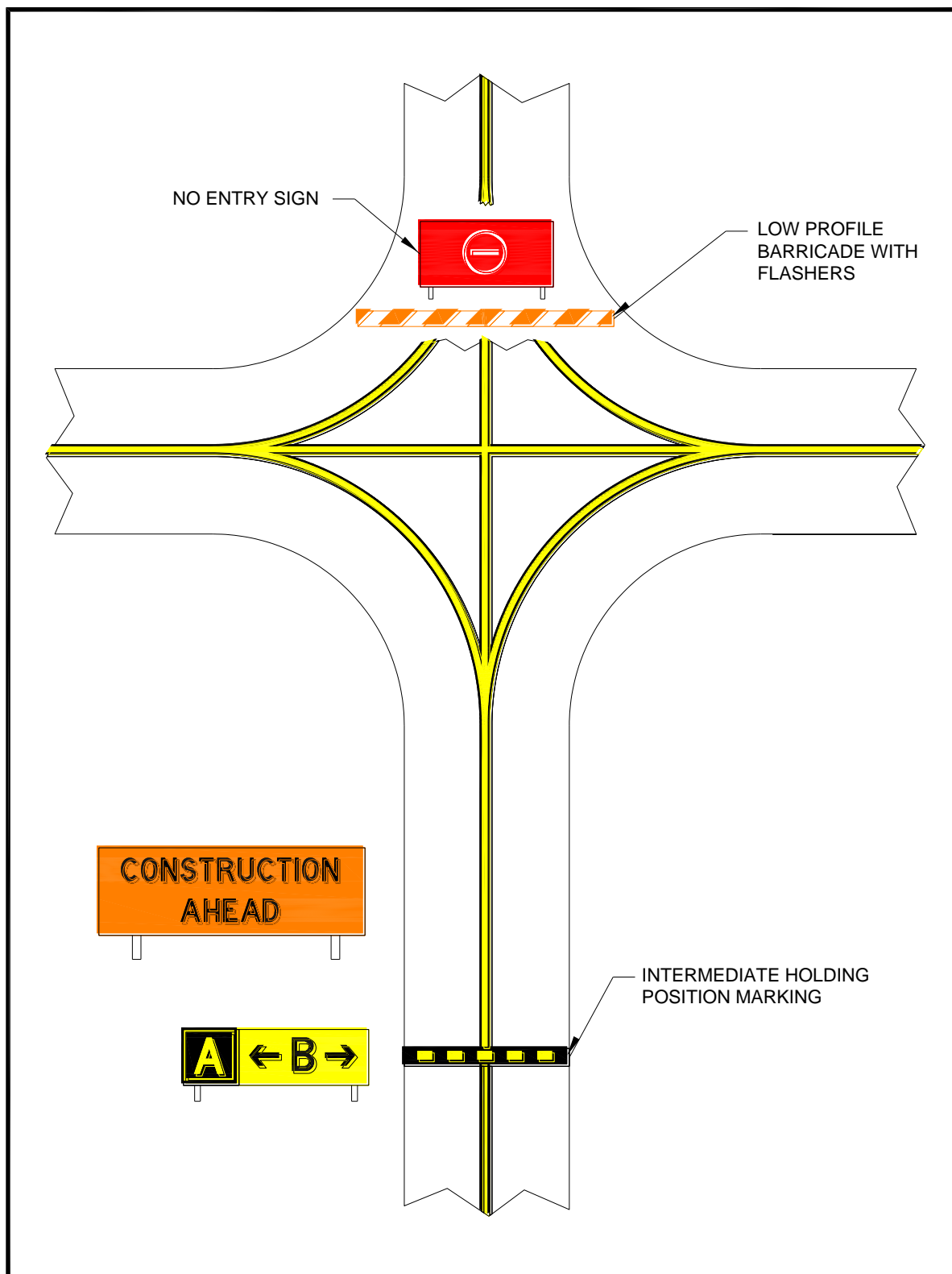
*See AC 150/5300-13 to complete the chart for a specific runway.

Page Intentionally Blank

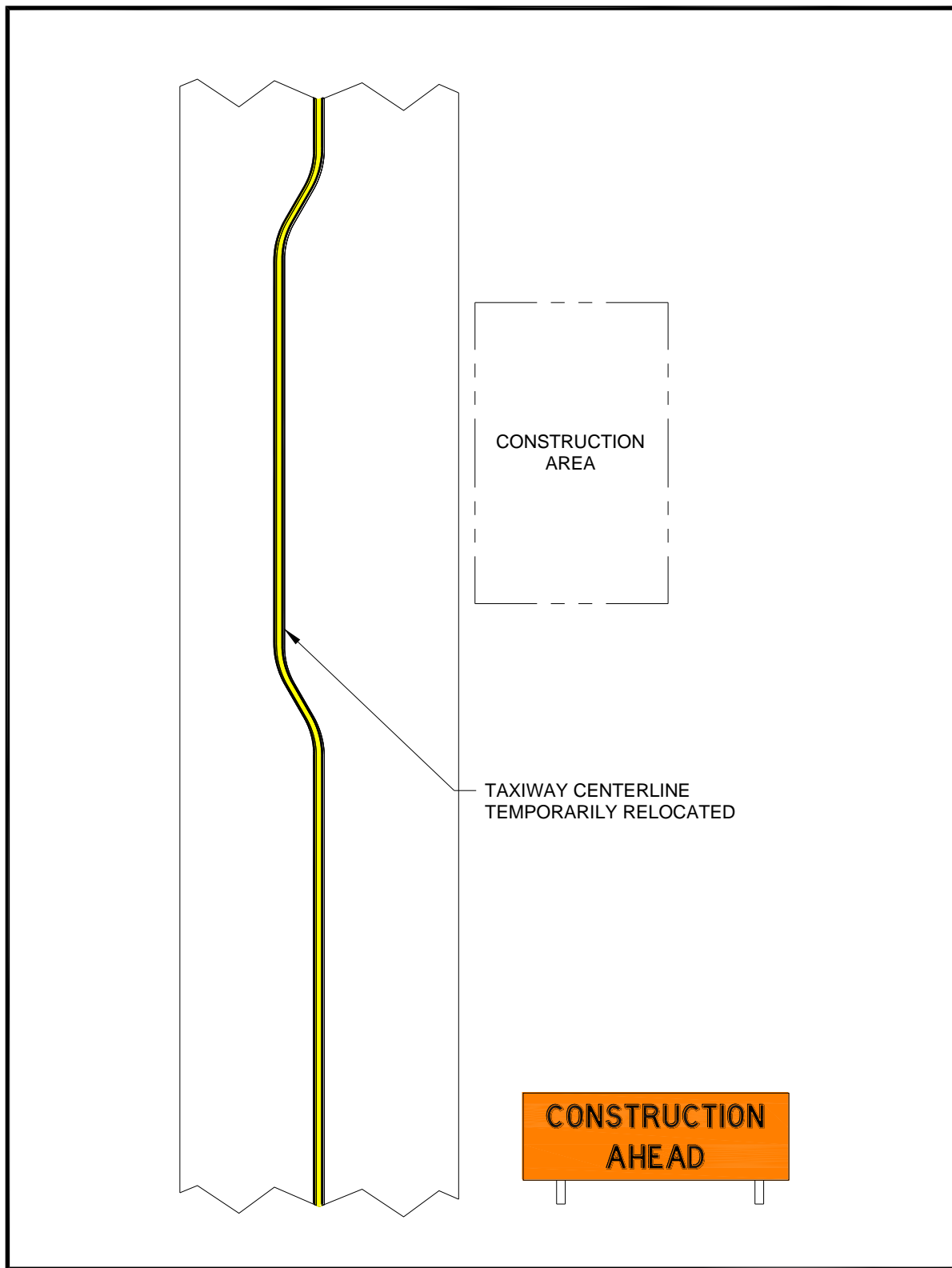
APPENDIX F. ORANGE CONSTRUCTION SIGNS

Figure F-1. Approved Sign Legends



Figure F-2. Orange Construction Sign Example 1

Note: For proper placement of signs, refer to EB 93.

Figure F-3. Orange Construction Sign Example 2

Note: For proper placement of signs, refer to EB 93.

Page Intentionally Blank

APPENDIX B

CONSTRUCTION SAFETY AND PHASING PLAN

CONSTRUCTION SAFETY AND PHASING PLAN

Schedule I

Runway 18/36 Rehabilitation

Schedule II

Taxiway B Rehabilitation between Taxiway A and Apron

Schedule III

Remove and Construct Mid-field Connector Taxiway B

MoDOT Project No. 20-028A-1

KIRKSVILLE
REGIONAL AIRPORT

Kirksville, Missouri

Sponsored By:

City of Kirksville
Federal Aviation Administration
MoDOT Aviation

JVIATION®

931 Wildwood Drive, Suite 101
Jefferson City, MO 65109

Main 573.636.3200
Fax 573.636.3201

Addendum No. 1
February 16, 2021

JVIATION.COM

TABLE OF CONTENTS

1.	COORDINATION	3
A.	CONTRACTOR PROGRESS MEETINGS.....	3
B.	SCOPE OR SCHEDULE CHANGES	3
C.	FAA ATO COORDINATION	3
2.	PHASING	4
A.	PHASE ELEMENTS	4
B.	CONSTRUCTION SAFETY DRAWINGS	6
3.	AREAS AND OPERATIONS AFFECTED BY THE CONSTRUCTION ACTIVITY	6
A.	IDENTIFICATION OF AFFECTED AREAS.....	6
B.	MITIGATION OF EFFECTS	7
4.	PROTECTION OF NAVIGATION AIDS (NAVAID's).....	7
5.	CONTRACTOR ACCESS	7
A.	LOCATION OF STOCKPILED CONSTRUCTION MATERIALS.....	7
B.	VEHICLE AND PEDESTRIAN OPERATIONS.....	8
6.	WILDLIFE MANAGEMENT.....	10
A.	TRASH	10
B.	STANDING WATER.....	11
C.	TALL GRASS AND SEEDS	11
D.	POORLY MAINTAINED FENCING AND GATES	11
E.	DISRUPTION OF EXISTING WILDLIFE HABITAT	11
7.	FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT	11
8.	HAZARDOUS MATERIAL (HAZMAT) MANAGEMENT	11
9.	NOTIFICATION OF CONSTRUCTION ACTIVITIES.....	11
A.	LIST OF RESPONSIBLE REPRESENTATIVES/POINTS OF CONTACT	12
B.	NOTICES TO AIRMEN (NOTAM)	12
C.	COORDINATION WITH ARFF PERSONNEL.....	12

D.	NOTIFICATION TO THE FAA.....	12
10.	INSPECTION REQUIREMENTS.....	13
A.	DAILY (OR MORE FREQUENT) INSPECTIONS.....	13
B.	FINAL INSPECTIONS.....	13
11.	UNDERGROUND UTILITIES.....	13
12.	PENALTIES.....	13
13.	SPECIAL CONDITIONS.....	13
14.	RUNWAY AND TAXIWAY VISUAL AIDS.....	13
A.	GENERAL.....	14
B.	MARKINGS.....	14
C.	LIGHTING AND VISUAL NAVAIDS.....	14
D.	SIGNS, TEMPORARY, INCLUDING ORANGE CONSTRUCTION SIGNS, AND PERMANENT SIGNS	14
15.	MARKING AND SIGNS FOR ACCESS ROUTES.....	14
16.	HAZARD MARKINGS AND LIGHTINGS.....	15
A.	PURPOSE.....	15
B.	EQUIPMENT.....	15
17.	PROTECTION OF RUNWAY AND TAXIWAY AREAS.....	15
A.	RUNWAY SAFETY AREA (RSA).....	15
B.	RUNWAY OBJECT FREE AREA (ROFA).....	15
C.	TAXIWAY SAFETY AREA (TSA)	15
D.	TAXIWAY OBJECT FREE AREA (TOFA).....	16
E.	OBSTACLE FREE ZONE (OFZ).....	16
F.	RUNWAY APPROACH/DEPARTURE SURFACES.....	16
18.	OTHER LIMITATIONS ON CONSTRUCTION.....	16
A.	PROHIBITIONS.....	16
B.	RESTRICTIONS.....	16
19.	Dust Control.....	17

1. COORDINATION

During construction, airport operational safety is of paramount importance. Coordination of project information to all individuals involved with the project is essential for ensuring safe operations are maintained at all times. In order to minimize the potential for incidents during construction, it is imperative that all individuals involved with the project and/or airport users be kept informed of any and all changes to operations. Discussions of operational safety will need to take place throughout the entire life of the project, including design, bidding, pre-construction, and construction. Meetings between the Resident Project Representative, Kirksville Regional Airport, Contractor, sub-contractors, airport tenants and airport users will be required to discuss specific project related impacts to operations. The Airport staff is ultimately responsible for the safety at the airport. Notice to users of operational changes due to construction will be issued via NOTAM's by the Airport. No closures will be permitted without the pertinent NOTAM in place for each specific closure. Emergency access for both Airport Rescue and Firefighting (ARFF) and off-airport (Police, Fire, and EMT) based emergency service shall be maintained at all times. Routing for such traffic shall be determined and made known to all supervisor personnel involved in the construction project. Coordination of this access will be proposed by the Contractor and approved by the Resident Project Representative and the Airport Manager.

A pre-construction meeting will be held prior to the Contractor beginning work or staging of major construction material and equipment on-site. The Airport, the Contractor's on-site supervisory staff, and representatives from the Engineer shall be present. Safety, this document and the Safety Plan Compliance Document (SPCD) prepared by the Contractor, will be a significant topic on the agenda. Additionally, operational safety during construction will be a main topic of discussion at the pre-construction meeting.

A. CONTRACTOR PROGRESS MEETINGS

The Contractor is required to have weekly construction progress meetings to discuss all relevant construction topics including safety reminders, scheduling, and general construction issues. Attendance of the Contractor, Resident Project Representative, Airport, and any other pertinent personnel are required at these meetings. Operational safety will be a standing agenda item for discussion during these progress meetings. A review of the Contractor's adherence to the project's Construction Safety and Phasing Plan (CSPP) and Safety Plan Compliance Document (SPCD) will be made at each meeting. Immediate correction of any deficiencies or violations will be required. The location and time of the weekly meetings will be determined during the pre-construction meeting. Where operational safety is concerned, the Contractor shall update the Resident Project Representative overseeing construction on a daily basis or more frequently if needed, of any changes or Contractor concerns.

B. SCOPE OR SCHEDULE CHANGES

In the event of a scope or schedule change, the Contractor shall notify the Resident Project Representative and the Airport Manager immediately. All parties involved will need to evaluate the impact(s) of the change and will determine what measures will need to be taken to maintain a safe construction site. Change in the scope or duration of the project may necessitate revisions to the Construction Safety and Phasing Plan (CSPP).

C. FAA ATO COORDINATION

The FAA Air Traffic Organization (ATO) will need to be notified immediately of any changes that affect aircraft movement within the airport which include airway facility shutdowns and restarts. The Airport will be responsible for coordinating any changes including NOTAM's

to the FAA ATO. This includes coordinating shut downs of FAA owned equipment and NAVAIDS.

2. PHASING

In order to minimize disruptions to airport operations during construction, construction will be broken up by areas to limit the amount of aircraft operational areas affected at any given time. Maintaining continual access to the runway, terminal building and air carrier apron is mandatory during all phases of construction to allow the airlines to operate during construction. The phasing plan proposed was developed with help from the Airport and is considered to be the most effective way of maintaining the required aircraft access, while imposing the least amount of impact on construction operations, and without sacrificing safety. The phasing for this project is presented below and is also visually depicted in the Construction Safety Drawings (Sheets G050 through G058) attached at the back of this document.

This project will be completed in three schedules having multiple phases in each schedule. Each of the phases is discussed in further detail in the Construction Safety Drawing plan sheets included at the end of this document.

A. PHASE ELEMENTS

1. Schedule I, Phase 1, 2 & 3 – Runway 18/36 Rehabilitation

The Contractor will be given **15** calendar days to complete Schedule I, Phase 1. The purpose for Schedule I, Phase 1 is to rehabilitate the middle third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

During this phase, the Contractor shall install a Temporary Displaced Threshold for Phase 2.

Prior to beginning work on this phase, the Contractor shall install a Temporary Displaced Threshold and have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

The Contractor will be given **60** calendar days to complete Schedule I, Phase 2. The purpose for Schedule I, Phase 2 is to rehabilitate the Northern third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall install a Temporary Displaced Threshold and have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

The Contractor will be given **20** calendar days to complete Schedule I, Phase 3. The purpose for Schedule I, Phase 3 is to rehabilitate the southern third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

2. Schedule II, Phase 4 – Taxiway B Rehabilitation between Taxiway A and Apron

The Contractor will be given **14** calendar days to complete Schedule II, Phase 4. The purpose for Schedule II, Phase 4 is to rehabilitate a portion of Taxiway B between Taxiway A and the Apron. This phase includes the portion of Taxiway B from the edge of the Apron to Taxiway A.

During work inside the Taxiway A safety area, portions of Taxiway A will have to be closed to traffic. This work shall be coordinated with the RPR and the Airport.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

3. Schedule III, Phase 1 & 3 – Remove and Construct Mid-field Connector Taxiway B

The Contractor will be given **60** calendar days to complete Schedule III, Phase 1. The purpose for Schedule III, Phase 1 is to relocate a portion of Taxiway B between Runway 18/36 and parallel Taxiway A. This phase includes the portion of Taxiway B from the edge of Runway 18/36 to Taxiway A.

The proposed construction will include removing the existing connector Taxiway B in its entirety between Runway 18/36 and Taxiway A and regrading the area to adhere to runway safety area criteria. The new connector Taxiway B pavement area will then be constructed along the northern half of the parallel Taxiway A and closer to the Runway 9/27 turf runway on the west side of Runway 18/36.

Stormwater infrastructure, including underdrain will be constructed as needed to properly drain taxiway pavement section. Electrical infrastructure design are also necessary components of this project.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Engineer/Airport to ensure that all pertinent NOTAM's are in place.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Engineer/Airport to ensure that all pertinent NOTAM's are in place.

B. CONSTRUCTION SAFETY DRAWINGS

The Construction Safety Drawings (Sheets G050 through G058) are attached at the back of this document to show the phasing requirements for this project. Along with the phasing information, those attached drawings also show aircraft access routes, ARFF access routes, pedestrian routes, ground service equipment routes, and contractor operation limits to help assist with airport operations and maintaining safety during this project. The Safety Plan (Sheet G050) and Construction Layout Plan (Sheet G051) are additional plan sheets containing safety requirements during construction and are also included in the back of this report.

3. AREAS AND OPERATIONS AFFECTED BY THE CONSTRUCTION ACTIVITY

All work within the Airport Operations Area shall be accomplished in conformance to Advisory Circular 150/5370-2G, Operational Safety on Airports During Construction. The contract drawings include information regarding requirements for operational safety on the airport during construction.

The Contractor shall prepare a detailed Safety Plan Compliance Document (SPCD) as stated in the Advisory Circular 150-5370-2G. The Contractor's SPCD shall identify specific methods, sequencing, phasing that he/she intends to use in order to accomplish the project work. The SPCD shall be submitted by the Contractor to the Engineer for approval prior to the pre-construction conference for the project. The Engineer will review the SPCD with the Sponsor/Owner and supply any changes or revisions to the Contractor for incorporation into the plan. The final SPCD shall be the result of a coordinated effort between the Owner/Sponsor, the Engineer and the Contractor.

The Contractor shall adhere to the approved SPCD as agreed upon by Airport Staff, Engineer, and Contractor. Modifications or deviations from the approved safety plan shall be submitted to the Engineer for review and approval prior to implementation.

A. IDENTIFICATION OF AFFECTED AREAS

Areas affected by construction activities associated with this project are identified on the Construction Safety Drawings. Construction activities associated with Schedule I will primarily take place along Runway 18/36. During construction activities associated with Schedule I, aircraft operations along Runway 18/36 will be affected, as described in greater detail in the attached project phasing sheets. Construction activities associated the Schedule II will primarily take place along Taxiway B between Taxiway A and the Apron. During construction activities associated with Schedule II aircraft operations along Taxiway A and Taxiway B will be affected. Construction activities associated with Schedule III will primarily take place along Taxiway B between Runway 18/36 and Taxiway A. During construction activities associated with Schedule III aircraft operation along Taxiway A and Runway 18/36 will be affected. Several NOTAM's will be required to be issued during this project to modify specific sections of Runway 18/36 and Taxiway B. Section 13 – Special Conditions of this document and the attached Construction Safety Drawings describe in detail which areas are affected and for what durations.

B. MITIGATION OF EFFECTS

To mitigate the effects of the construction activities associated with the project; alternative routes have been established for emergency and ARFF vehicles, aircraft taxiway movements have been considered and phasing plans have been created. Because the phasing for this project is critical to maintaining safety and operations at the airport during construction, adhering to the requirements as laid out in the attached phasing sheets is imperative. To help assist all individuals with this process, it is important that all airport personnel, contractor personnel, and engineering personnel discuss current and upcoming phases during the required weekly construction progress meetings as mentioned in Section 1 of this document.

4. PROTECTION OF NAVIGATION AIDS (NAVAID'S)

The Contractor should be aware of the location of all NAVAID equipment as haul roads are being established in order to ensure that this equipment will be protected for the duration of the project. Should any haul road pass near existing airport NAVAID equipment, the Contractor shall protect these structures from damage. Any damage to any airport NAVAID equipment due to construction activities shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost to the Sponsor.

5. CONTRACTOR ACCESS

The Contractor will be required to submit to Airport staff prior to the commencement of construction, evidence in the form of a certification letter that all of their employees who will have unescorted access to the SIDA have been checked for employment, security, and criminal history for the last ten years. The letter will also certify that these employees meet all security regulations as required by the Sponsor's security program.

During the course of the construction operations, the Contractor will be allowed to utilize a maximum of two (2) airport access "Security Gate" as entrance to the airfield and construction site. Only vehicular access is permitted through the access gates into the construction area, pedestrian access through the access gates is not allowed. The airport shall designate this gate and the associated haul roads. The gate may be opened only for authorized vehicle traffic flow. During times of infrequent construction traffic the gate shall be closed, even when a gate guard is present. At such times as this gate is not guarded, it shall be closed and securely locked. During daylight hours, all authorized vehicles and construction equipment must display either a three-foot by three-foot flag with international orange and white 12-inch squares displayed in full view above the vehicles or lighted rotating beacons. During night time operations only lighted rotating beacons are acceptable. Passengers in any authorized vehicles shall be the responsibility of the Contractor. The "gate guard" shall allow no unauthorized vehicle or person to enter the "air operations" side of the airport without the above stipulated "security clearance." The Contractor and the Contractor's "security gate guard" shall be held duly responsible to uphold the above security stipulations at all times during the progress of the construction project. No deviations from these security measures shall be allowed at any time. Penalties associated with deviations from these security provisions are identified in Section 12 of this document.

A. LOCATION OF STOCKPILED CONSTRUCTION MATERIALS

The Contractor's staging area is shown on the Construction Layout Plan (Sheet G051) and is located to the north of the airports long term parking lot. Any stockpiling activities shall be conducted outside of the all runway/taxiway object free areas as well. Stockpiles shall be identified and lighted in accordance with Section 16. Stockpiles shall be maintained in such manner that they are not a wildlife attractant in accordance with Section 6 and they do not

generate FOD that could be tracked onto active pavement surfaces in accordance with Section 7.

B. VEHICLE AND PEDESTRIAN OPERATIONS

1. Construction Site Parking

Construction employee parking will be outside of the Airport Operations Area (AOA) and outside of the airport perimeter fence.

2. Construction Equipment Parking

Construction equipment parking will be allowed at the contractor's staging area in the location as shown on the Construction Layout Plan (Sheet G051), or at a location approved by the Resident Project Engineer. If the equipment must be parked in an Airport Operations Area (AOA), the equipment must be lighted with a beacon per AC 150/5370-2G. No equipment or material shall be parked or stored in any runway or taxiway safety area or object free area.

3. Access and Haul Roads

The access points to the project are depicted on Sheet G051. The contractor shall keep all access gates closed and locked when not in use. When a gate is open, it shall be appropriately guarded by the contractor to ensure that no unauthorized vehicles or personnel enter airport property.

The Contractor shall obtain approval from the Engineer prior to establishing haul roads within the airport property. Once established, the haul roads shall be utilized for all equipment traffic, and the equipment shall not be allowed to stray or wander away from the established routes. The haul roads shall be the responsibility of the Contractor and shall always be maintained and kept in good order. When required, water shall be applied at the locations and in the amounts necessary to minimize dust and dirt in the air operations area. Since construction operations will be within active airport operation areas, the airport will require additional dust control measures be used on haul roads and the work area in order not to interfere with airport operations. Haul roads that cross any active taxiway, movement areas, non-movement areas or active areas of the ramp shall be kept clean and in good order at all times. The Contractor shall always be prepared to repair any damage caused by the movement of equipment on any of the haul roads at the direction of the Engineer, whether in designated or undesignated areas. After completion of the project, the Contractor shall be required to regrade any unpaved portions of the haul road and to reseed the area with local native grasses to match the existing conditions of the area. The performance of any work as specified by this provision, including watering, maintenance, and repair of the haul roads, shall not be measured and paid for directly, but shall be considered as necessary and incidental to the work. Each day prior to beginning hauling operations the Contractor shall notify the Engineer and Airport of their proposed hauling schedule. Therefore, the Contractor is required to give Airport Personnel 72 hours notice prior to beginning hauling operations, so that the Airport can issue the appropriate NOTAM's.

Establishment of haul roads off of Airport property shall be the sole responsibility of the Contractor.

Contractor movement shall be restricted to the pre-determined access routes as shown on the attached Construction Safety Drawings and within the work area. Work areas shall be delineated with barricades as shown on the phasing drawings. The Contractor shall not operate outside of these areas without approval of the Engineer or Airport Manager.

4. Marking and Lighting of Vehicles

All vehicles operating within the AOA and in the movement/non-movement areas must clearly identify themselves for control purposes. The identification symbols should be a minimum 8-inch block-type characters of a contrasting color and easy to read. They may be applied either by using tape or a water-soluble paint to facilitate removal. Magnetic signs are also acceptable.

To operate within the AOA during daylight hours, the vehicle must have a flag (day only) or yellow flashing light (day or night) attached to it. Any vehicle operation within the AOA during hours of darkness or reduced visibility must be equipped with a yellow flashing light. Flashing lights must be mounted on the uppermost part of the vehicle structure. Flags shall be at least 3-foot by 3-foot square having a checkered pattern of international orange and white squares at least 1 foot on each side. All flashing lights and/or flags shall be kept in good condition and immediately replaced if requested by the Engineer or Airport.

5. Description of Proper Vehicle Operations

Proper vehicle operations are described as confirming to all rules and regulation for driving as directed by the Airport. Any unescorted vehicle operator, operating a vehicle within the AOA, must satisfactorily complete Kirksville Regional Airport's Air Operations Area Driver Training Course, prior to operating a vehicle within the AOA. Access shall be restricted to established haul routes and work areas.

6. Required Escorts

All personnel requiring escort privileges will need to place a request with the Resident Project Representative and Airport Manager at least 72 hours in advance. When any vehicle, other than one that has prior approval from the Airport operator, must travel over any portion of an aircraft movement area, the vehicle will be escorted by a badged representative, and properly identified. To operate in those areas during daylight hours, the vehicle must have a flag (day only) or beacon (day or night) attached to it. Any vehicle operation on the movement areas during hours of darkness or reduced visibility must be equipped with a flashing dome-type beacon.

7. Training Requirements of Vehicle Drivers

The Contractor will not be allowed unescorted access to the AOA. If the Contractor requires access to the AOA, they must request an escort from Airport Manager as discussed above in Section 6.

8. Situational Awareness

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility

of the escort vehicle driver to verify movement/position of all escorted vehicles at any given time.

9. Two-way Radio Communication Procedures

The contractor shall be required to monitor transceiver radios tuned to the Kirksville Regional Airport Common Traffic Advisory Frequency 122.8 MHz. The contractor shall supply adequate radios. Such radios shall be used to obtain proper clearance in regards to the movement of equipment, trucks, etc. within the movement area.

When any construction activities are required within the Taxiway Object Free Area (TOFA) a flagman, who is monitoring a radio, shall be positioned within the work area in such a manner they can clear construction men and equipment from the TOFA during aircraft operation on the associated Taxiway. Prior to any construction activities within a TOFA, such activities must first be coordinated with Airport Operations.

Further, any unusual occurrences in the flight pattern of approaching or departing aircraft shall be acknowledged by all concerned so that operations of the airport and the construction work can be safely carried on at all times.

10. Maintenance of the Secured Area of the Airport

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Throughout the duration of construction, it is anticipated that there will only be two access points for construction personnel. These access points will consist of existing gates located within the existing perimeter fence as shown in the Construction Layout and Phasing Plans. The gates will be equipped so that they can be securely closed and locked to prevent unauthorized access. During hauling activities, a gate guard will be positioned at the gate. During times of infrequent hauling the gate shall be closed, even when the gate guard is present.

Because the Airport is subject to 49 CFR Part 1542, *Airport Security*, even during construction, the Airport must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

11. Construction Site Safety

All personnel working on the construction site, including gate guards, are recommended to have personal protective equipment on at all times. This includes but is not limited to vests, hard hats, hearing protection, eye protection, and radios.

6. WILDLIFE MANAGEMENT

All wildlife management within the Airport Operations Area shall be accomplished in conformance to Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, and Certalert 98-05, *Grasses Attractive to Hazardous Wildlife*. In general, the Contractor must carefully control and continuously remove waste or loose material that might attract wildlife.

A. TRASH

The Contractor is responsible to complete a daily inspection or more frequently, if deemed necessary by the Resident Project Representative, of the construction site (including the Contractor's Staging Area) for any trash or objects that might attract wildlife.

B. STANDING WATER

Because standing water can attract wildlife, the Contractor is responsible to complete a daily inspection of the construction site for any standing water. With the discretion of the Resident Project Representative, the Contractor shall remove this hazard.

C. TALL GRASS AND SEEDS

The Contractor will install soil, seeding and hydromulch as specified in the *T-901 Seeding* specification for this project or as directed by the Engineer.

D. POORLY MAINTAINED FENCING AND GATES

The Contractor shall be required to maintain all fences and gates throughout the duration of the project, to the satisfaction of the Resident Project Representative.

E. DISRUPTION OF EXISTING WILDLIFE HABITAT

The Contractor shall notify the Resident Project Representative when a wildlife sighting has occurred on the project site to mitigate any disruption to the existing wildlife habitat.

7. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

The presence of FOD on the apron is a significant safety concern, as debris can be ingested into an aircraft's engine causing extensive damage, or can be launched across the apron by jet blast, potentially causing bodily injury or damaging other aircraft. Materials capable of creating FOD must be continuously removed during the construction project. The Contractor is required to keep all taxiways and aprons, open to aircraft free from FOD at all times. The Contractor is required to maintain FOD control continually and to the satisfaction of the Resident Project Representative. FOD Control measures shall include the use of power brooms, FOD boss, and manual removal as well as any other means deemed necessary. Prior to opening any pavement to aircraft, the Contractor shall conduct a sweep of the pavement to verify that it is FOD free. The apron areas and Taxiway A to the south of the limits of construction will be a high priority area during this project as commercial aircraft will be in the vicinity of this area on a daily basis throughout most of the construction process.

8. HAZARDOUS MATERIAL (HAZMAT) MANAGEMENT

Although hazardous material is not anticipated to be present on this project, if hazardous material is encountered, the Contractor shall inform the Resident Project Representative and Airport immediately. Additionally, the Contractor shall always have available Material Safety Data Sheets or Product Safety Data Sheets for all Hazardous Materials utilized on-site, such as fuel, and readily available. Immediate notification of the Airport is required for any Hazardous Material Spill.

9. NOTIFICATION OF CONSTRUCTION ACTIVITIES

Prior to commencing any construction activities as well as prior to beginning a new construction phase the Contractor shall notify the Resident Project Representative and Airport Operations 72 hours in advance. During construction activities the Contractor shall immediately notify the Resident Project Representative and Airport Operations of any conditions that may adversely affect the operational safety of the Airport.

A. LIST OF RESPONSIBLE REPRESENTATIVES/POINTS OF CONTACT

Agency Name	Type of Agency	Telephone No.
Airport Emergency	Aircraft Rescue and Fire Fighting	(660) 665-5020
Kirksville Police Department	Police Department	(660) 785-6945 Or 911
Kirksville Fire Department	Fire Department	(660) 665-3734 Or 911
Complete Family Medicine Urgent Care	Urgent Care	(660) 665-7575 Or 911
Northeast Regional Medical Center	Hospital	(660) 785-1000 Or 911
Airport Administrative	Airport Administration	(660) 665-5020
Kirksville Airport Operations	Airport Operations	(660) 665-5020
Jviation, Inc. Kevin Scherr	Project Manager	(720) 527-2927 Cell

B. NOTICES TO AIRMEN (NOTAM)

Only Airport Operations may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway or taxiway. Airport Operations must coordinate the issuance, maintenance, and cancellation of NOTAMs about Airport conditions resulting from construction activities 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 Contractor must notify the Resident Project Representative, or designated representative, when scheduling/scoping for the project has changed or required a pavement closure that would require a modification or addition to the NOTAMs.

EMERGENCY NOTIFICATION PROCEDURES

In an event of an emergency, the Contractor shall notify the Resident Project Representative and Airport staff. If necessary, the Contractor shall contact 911 and Airport Emergency.

C. COORDINATION WITH ARFF PERSONNEL

In an event that the Contractor must coordinate construction activities with ARFF Personnel, the Contractor will notify Airport staff or Resident Project Representative. The Airport staff or Resident Project Representative will be responsible to notify the event to ARFF Personnel. There are no planned interruptions to water lines associated with this project.

D. NOTIFICATION TO THE FAA

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.

Regarding any NAVAID's damage, the Airport shall contact 1-866-432-2622.

The anticipated impacts to Airport or FAA owned NAVAIDS occur during Schedule I, Phase 1, 2 and 3 of the project when Runway 18/36 will be limited and/or shut down. The Contractor will be responsible for any damage to any other NAVAIDS. If a shutdown of a NAVAID is required of more than 24 hours or more than 4 hours daily on consecutive days a minimum notice of 45 days must be given to the FAA ATO/Technical Operations prior to the shutdown commencing.

10. INSPECTION REQUIREMENTS

A. DAILY (OR MORE FREQUENT) INSPECTIONS

Inspections shall be conducted daily and more frequently if necessary by the Resident Project Representative to ensure conformance with this document. The checklist provided at the end of this report was copied from FAA AC 150/5370-2G Appendix 4, *Construction Project Daily Safety Inspection Checklist*. This checklist shall be completed by the Contractor to the Engineer's satisfaction and the Contractor shall submit a copy of all the completed checklists to the Engineer and the Airport Manager. The Contractor should fill out this checklist everyday construction operations occur on this project. Any deficiencies identified during inspection or otherwise shall be remedied immediately.

B. FINAL INSPECTIONS

Final inspections shall be conducted after every construction phase is complete as detailed in Section 2 of this document. The final inspection should be completed with the Contractor, Resident Project Representative, and Airport Manager.

11. UNDERGROUND UTILITIES

Prior to beginning excavation activities the Contractor shall notify the Resident Project Representative and Airport Operations at least 3 working days prior to the scheduled excavation. The FAA shall attempt to locate all of their underground cables that are located in the vicinity of the work areas, prior to construction in the area. The Contractor shall attempt to locate the Sponsor's underground cables and other sub-surface utilities prior to construction. Damage to the underground cables, whether FAA's or Sponsor's, through negligence on the part of the Contractor will require replacement by the Contractor at no cost to the Sponsor. Any splicing or replacing of damaged cable shall meet current FAA specifications. Damage to other underground utilities through Contractor's negligence shall be repaired according to the relevant utility's standards and at no cost to the Sponsor. In the event of an accidental utility disruption Airport Operations will be contacted at the numbers listed in Section 9.A.

12. PENALTIES

Penalties are based on the Airport's security policies. The Contractor is responsible for any penalties that the Airport may distribute.

13. SPECIAL CONDITIONS

The contractor shall provide the necessary dust control to ensure that dust from the haul routes and construction areas is kept to a minimum.

14. RUNWAY AND TAXIWAY VISUAL AIDS

A. GENERAL

A section of Runway 18/36 and Taxiway's A and B will be closed during this project. The Contractor will need to install approved lighted, low-profile barricades to close off the various construction areas. In addition to the barricades, the Contractor will need to cover the taxiway and runway lights/signs with an approved method along the closed section of runway and taxiway.

B. MARKINGS

The procedure to close off the apron/taxiway for construction shall consist of placing barricades and flashers on the perimeter of the construction. For the runway/taxiway intersections, a closed taxiway "X" and low-profile barricades located outside of the RSA, will be utilized, as shown in the phasing plan sheets at the end of this document or as directed by the Engineer. The procedure to close off the runway for construction shall consist of lighted runway closure "X's" and low-profile barricades located outside the RSA, will be utilized, as shown in the phasing plan sheets at the end of this document or as directed by the Engineer.

C. LIGHTING AND VISUAL NAVAIDS

A section of Runway 18/36 and Taxiway's A and B will be closed during a portion of this project. The Contractor will need to install approved lighted, low-profile barricades during the various phases of work. In addition to the barricades, the contractor will need to cover the taxiway and runway lights with an approved method along the closed section of the taxiway and runway.

D. SIGNS, TEMPORARY, INCLUDING ORANGE CONSTRUCTION SIGNS, AND PERMANENT SIGNS

In addition to erecting barricades and covering lights, the Contractor will need to cover any taxiway and/or runway signs that lead to closed pavements during construction.

15. MARKING AND SIGNS FOR ACCESS ROUTES

All required signs and markings shall conform to Advisory Circular 150/5340-18, *Standard for Airport Sign Systems*, and to the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), to the extent possible. Signs adjacent to areas used by aircraft must comply with the frangible requirements as stated in Advisory Circular, 150/5220-23 *Frangible Connections*. The location and design of any signs will be directed by the Engineer or Airport Manager and the signs shall be provided and installed by the Contractor.

16. HAZARD MARKINGS AND LIGHTINGS

A. PURPOSE

The hazard marking and lighting prevents pilots from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. Prior to construction on or adjacent to any taxiway or apron, the Contractor shall, upon approval by the Engineer, close the taxiway and/or apron, in accordance with the specific phasing plan associated with that phase, prior to beginning work. The Contractor shall be responsible for clearly marking and defining the closed taxiways by use of warning lights, barricades, flags and closed taxiway or runway markings in conformance with Advisory Circular 150/5370-2G. The Contractor shall be responsible for maintaining these barricades and keeping them clearly visible at all times. The Contractor's individuals responsible, as well as their contact information, for the maintenance of the hazard marking and lighting equipment are listed in Section 9 A. of this document.

Specific marking and lighting equipment details, location and other pertinent information regarding hazard marking materials including low-profile barricades are shown on the Construction Safety Drawings, attached to the back of this document. Please note that each phase may have unique details. Additionally, prior to any deviations in location or type of hazard marking materials shall be coordinated with the Resident Project Representative and Airport Operations.

B. EQUIPMENT

Approved low-profile barricades are to identify and define the limits of construction and hazardous areas on airports. Physical requirements and spacing of the barricades are specified in the construction drawings for this project. The barricades must be weighted down per the manufacturer's recommendations to prevent the barricades from moving due to wind or jet blast.

The flashing lights on the approved barricades must meet the luminance requirement of the State Highway Department. The flashing lights must be red or an approved equal.

17. PROTECTION OF RUNWAY AND TAXIWAY AREAS

A. RUNWAY SAFETY AREA (RSA)

The Kirksville Airport defines the Safety Area for Runway 18/36 as the area that is within 250 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the RSA of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

B. RUNWAY OBJECT FREE AREA (ROFA)

The Kirksville Regional Airport defines the Object Free Area for Runway 18/36 as the area that is within 400 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the ROFA of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

C. TAXIWAY SAFETY AREA (TSA)

The Kirksville Regional Airport defines the Safety Area for Taxiway A as the area that is within 39.5 feet from the centerline of Taxiway A. Construction activities associated with Schedules

II and III will be completed within the TSA of Taxiway's A and B. During these construction activities Taxiway A will be closed from Taxiway C to the North, Taxiway B will be closed from the Apron to Runway 18/36.

Open trenches and excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, cover the excavations appropriately.

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting aircraft rescue and fire fighting equipment, snow removal equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

D. TAXIWAY OBJECT FREE AREA (TOFA)

The Kirksville Regional Airport defines the Object Free Area for Taxiway A as the area that is within 65.5 feet from the centerline of Taxiway A. Construction activities associated with Schedules II and III will be completed within the TOFA of Taxiway's A and B. During these construction activities Taxiway A will be closed from Taxiway C to the North, Taxiway B will be closed from the Apron to Runway 18/36. No work is permitted within the TOFA of any active pavement.

E. OBSTACLE FREE ZONE (OFZ)

The Kirksville Regional Airport defines the Obstacle Free Zone for Runway 18/36 as the area that is within 200 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the OFZ of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

Personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If it is necessary to enter the OFZ, it would be necessary to coordinate with the FAA

F. RUNWAY APPROACH/DEPARTURE SURFACES

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in Appendix 2, "Threshold Siting Requirement," of Advisory Circular 150/5300-13. NEED TO REVIEW THIS SECTION AS WE WILL BE UTILIZING A DISPLACED THRESHOLD.

18. OTHER LIMITATIONS ON CONSTRUCTION

A. PROHIBITIONS

The use of open flame welding or torches is prohibited unless adequate fire safety precautions are provided and the Airport Manager has approved their use. The use of flare pots within the AOA is prohibited at all times. The use of electrical blasting caps is prohibited on or within 1,000 feet of the Airport property.

B. RESTRICTIONS

Construction suspension may be required during specific Airport Operations. Project areas may be worked on simultaneously only if approved by the Resident Project Representative

and Airport Operations. Night construction may only be performed if approved by the Resident Project Representative and Airport Operations. Construction operations shall only be allowed in weather conditions compliant with the project specifications.

19. DUST CONTROL

The Contractor is responsible for controlling dust from the construction site at all times. The Contractor shall have a water truck and operator available 24 hours a day to control dust since the project's locations is near active runways, taxiways, and aprons. It is critical for the contractor to keep dust to an absolute minimum both during construction and after construction until the exposed surfaces contain suitable vegetation. The Contractor shall provide the Resident Project Representative and Airport Operations with a contact for 24-hour dust control.

D.	NOTIFICATION TO THE FAA.....	12
10.	INSPECTION REQUIREMENTS.....	13
A.	DAILY (OR MORE FREQUENT) INSPECTIONS.....	13
B.	FINAL INSPECTIONS.....	13
11.	UNDERGROUND UTILITIES.....	13
12.	PENALTIES.....	13
13.	SPECIAL CONDITIONS.....	13
14.	RUNWAY AND TAXIWAY VISUAL AIDS.....	13
A.	GENERAL.....	14
B.	MARKINGS.....	14
C.	LIGHTING AND VISUAL NAVAIDS.....	14
D.	SIGNS, TEMPORARY, INCLUDING ORANGE CONSTRUCTION SIGNS, AND PERMANENT SIGNS	14
15.	MARKING AND SIGNS FOR ACCESS ROUTES.....	14
16.	HAZARD MARKINGS AND LIGHTINGS.....	15
A.	PURPOSE.....	15
B.	EQUIPMENT.....	15
17.	PROTECTION OF RUNWAY AND TAXIWAY AREAS.....	15
A.	RUNWAY SAFETY AREA (RSA).....	15
B.	RUNWAY OBJECT FREE AREA (ROFA).....	15
C.	TAXIWAY SAFETY AREA (TSA)	15
D.	TAXIWAY OBJECT FREE AREA (TOFA).....	16
E.	OBSTACLE FREE ZONE (OFZ).....	16
F.	RUNWAY APPROACH/DEPARTURE SURFACES.....	16
18.	OTHER LIMITATIONS ON CONSTRUCTION.....	16
A.	PROHIBITIONS.....	16
B.	RESTRICTIONS.....	16
19.	Dust Control.....	17

1. COORDINATION

During construction, airport operational safety is of paramount importance. Coordination of project information to all individuals involved with the project is essential for ensuring safe operations are maintained at all times. In order to minimize the potential for incidents during construction, it is imperative that all individuals involved with the project and/or airport users be kept informed of any and all changes to operations. Discussions of operational safety will need to take place throughout the entire life of the project, including design, bidding, pre-construction, and construction. Meetings between the Resident Project Representative, Kirksville Regional Airport, Contractor, sub-contractors, airport tenants and airport users will be required to discuss specific project related impacts to operations. The Airport staff is ultimately responsible for the safety at the airport. Notice to users of operational changes due to construction will be issued via NOTAM's by the Airport. No closures will be permitted without the pertinent NOTAM in place for each specific closure. Emergency access for both Airport Rescue and Firefighting (ARFF) and off-airport (Police, Fire, and EMT) based emergency service shall be maintained at all times. Routing for such traffic shall be determined and made known to all supervisor personnel involved in the construction project. Coordination of this access will be proposed by the Contractor and approved by the Resident Project Representative and the Airport Manager.

A pre-construction meeting will be held prior to the Contractor beginning work or staging of major construction material and equipment on-site. The Airport, the Contractor's on-site supervisory staff, and representatives from the Engineer shall be present. Safety, this document and the Safety Plan Compliance Document (SPCD) prepared by the Contractor, will be a significant topic on the agenda. Additionally, operational safety during construction will be a main topic of discussion at the pre-construction meeting.

A. CONTRACTOR PROGRESS MEETINGS

The Contractor is required to have weekly construction progress meetings to discuss all relevant construction topics including safety reminders, scheduling, and general construction issues. Attendance of the Contractor, Resident Project Representative, Airport, and any other pertinent personnel are required at these meetings. Operational safety will be a standing agenda item for discussion during these progress meetings. A review of the Contractor's adherence to the project's Construction Safety and Phasing Plan (CSPP) and Safety Plan Compliance Document (SPCD) will be made at each meeting. Immediate correction of any deficiencies or violations will be required. The location and time of the weekly meetings will be determined during the pre-construction meeting. Where operational safety is concerned, the Contractor shall update the Resident Project Representative overseeing construction on a daily basis or more frequently if needed, of any changes or Contractor concerns.

B. SCOPE OR SCHEDULE CHANGES

In the event of a scope or schedule change, the Contractor shall notify the Resident Project Representative and the Airport Manager immediately. All parties involved will need to evaluate the impact(s) of the change and will determine what measures will need to be taken to maintain a safe construction site. Change in the scope or duration of the project may necessitate revisions to the Construction Safety and Phasing Plan (CSPP).

C. FAA ATO COORDINATION

The FAA Air Traffic Organization (ATO) will need to be notified immediately of any changes that affect aircraft movement within the airport which include airway facility shutdowns and restarts. The Airport will be responsible for coordinating any changes including NOTAM's

to the FAA ATO. This includes coordinating shut downs of FAA owned equipment and NAVAIDS.

2. PHASING

In order to minimize disruptions to airport operations during construction, construction will be broken up by areas to limit the amount of aircraft operational areas affected at any given time. Maintaining continual access to the runway, terminal building and air carrier apron is mandatory during all phases of construction to allow the airlines to operate during construction. The phasing plan proposed was developed with help from the Airport and is considered to be the most effective way of maintaining the required aircraft access, while imposing the least amount of impact on construction operations, and without sacrificing safety. The phasing for this project is presented below and is also visually depicted in the Construction Safety Drawings (Sheets G050 through G058) attached at the back of this document.

This project will be completed in three schedules having multiple phases in each schedule. Each of the phases is discussed in further detail in the Construction Safety Drawing plan sheets included at the end of this document.

A. PHASE ELEMENTS

1. Schedule I, Phase 1, 2 & 3 – Runway 18/36 Rehabilitation

The Contractor will be given **15** calendar days to complete Schedule I, Phase 1. The purpose for Schedule I, Phase 1 is to rehabilitate the middle third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

During this phase, the Contractor shall install a Temporary Displaced Threshold for Phase 2.

Prior to beginning work on this phase, the Contractor shall install a Temporary Displaced Threshold and have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

The Contractor will be given **60** calendar days to complete Schedule I, Phase 2. The purpose for Schedule I, Phase 2 is to rehabilitate the Northern third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall install a Temporary Displaced Threshold and have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

The Contractor will be given **20** calendar days to complete Schedule I, Phase 3. The purpose for Schedule I, Phase 3 is to rehabilitate the southern third portion of Runway 18/36.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

2. Schedule II, Phase 4 – Taxiway B Rehabilitation between Taxiway A and Apron

The Contractor will be given **14** calendar days to complete Schedule II, Phase 4. The purpose for Schedule II, Phase 4 is to rehabilitate a portion of Taxiway B between Taxiway A and the Apron. This phase includes the portion of Taxiway B from the edge of the Apron to Taxiway A.

During work inside the Taxiway A safety area, portions of Taxiway A will have to be closed to traffic. This work shall be coordinated with the RPR and the Airport.

The proposed construction will include concrete panel replacement, concrete joint sealant replacement, spall repair, crack repair and installation of pavement markings.

Prior to beginning work on this phase, the Contractor shall have taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Project Representative/Airport to ensure that all pertinent NOTAM's are in place.

3. Schedule III, Phase 1 & 3 – Remove and Construct Mid-field Connector Taxiway B

The Contractor will be given **60** calendar days to complete Schedule III, Phase 1. The purpose for Schedule III, Phase 1 is to relocate a portion of Taxiway B between Runway 18/36 and parallel Taxiway A. This phase includes the portion of Taxiway B from the edge of Runway 18/36 to Taxiway A.

The proposed construction will include removing the existing connector Taxiway B in its entirety between Runway 18/36 and Taxiway A and regrading the area to adhere to runway safety area criteria. The new connector Taxiway B pavement area will then be constructed along the northern half of the parallel Taxiway A and closer to the Runway 9/27 turf runway on the west side of Runway 18/36.

Stormwater infrastructure, including underdrain will be constructed as needed to properly drain taxiway pavement section. Electrical infrastructure design are also necessary components of this project.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Engineer/Airport to ensure that all pertinent NOTAM's are in place.

Prior to beginning work on this phase, the Contractor shall have runway and taxiway closure markers and barricades in place in accordance with the plans and shall coordinate with the Resident Engineer/Airport to ensure that all pertinent NOTAM's are in place.

B. CONSTRUCTION SAFETY DRAWINGS

The Construction Safety Drawings (Sheets G050 through G058) are attached at the back of this document to show the phasing requirements for this project. Along with the phasing information, those attached drawings also show aircraft access routes, ARFF access routes, pedestrian routes, ground service equipment routes, and contractor operation limits to help assist with airport operations and maintaining safety during this project. The Safety Plan (Sheet G050) and Construction Layout Plan (Sheet G051) are additional plan sheets containing safety requirements during construction and are also included in the back of this report.

3. AREAS AND OPERATIONS AFFECTED BY THE CONSTRUCTION ACTIVITY

All work within the Airport Operations Area shall be accomplished in conformance to Advisory Circular 150/5370-2G, Operational Safety on Airports During Construction. The contract drawings include information regarding requirements for operational safety on the airport during construction.

The Contractor shall prepare a detailed Safety Plan Compliance Document (SPCD) as stated in the Advisory Circular 150-5370-2G. The Contractor's SPCD shall identify specific methods, sequencing, phasing that he/she intends to use in order to accomplish the project work. The SPCD shall be submitted by the Contractor to the Engineer for approval prior to the pre-construction conference for the project. The Engineer will review the SPCD with the Sponsor/Owner and supply any changes or revisions to the Contractor for incorporation into the plan. The final SPCD shall be the result of a coordinated effort between the Owner/Sponsor, the Engineer and the Contractor.

The Contractor shall adhere to the approved SPCD as agreed upon by Airport Staff, Engineer, and Contractor. Modifications or deviations from the approved safety plan shall be submitted to the Engineer for review and approval prior to implementation.

A. IDENTIFICATION OF AFFECTED AREAS

Areas affected by construction activities associated with this project are identified on the Construction Safety Drawings. Construction activities associated with Schedule I will primarily take place along Runway 18/36. During construction activities associated with Schedule I, aircraft operations along Runway 18/36 will be affected, as described in greater detail in the attached project phasing sheets. Construction activities associated the Schedule II will primarily take place along Taxiway B between Taxiway A and the Apron. During construction activities associated with Schedule II aircraft operations along Taxiway A and Taxiway B will be affected. Construction activities associated with Schedule III will primarily take place along Taxiway B between Runway 18/36 and Taxiway A. During construction activities associated with Schedule III aircraft operation along Taxiway A and Runway 18/36 will be affected. Several NOTAM's will be required to be issued during this project to modify specific sections of Runway 18/36 and Taxiway B. Section 13 – Special Conditions of this document and the attached Construction Safety Drawings describe in detail which areas are affected and for what durations.

B. MITIGATION OF EFFECTS

To mitigate the effects of the construction activities associated with the project; alternative routes have been established for emergency and ARFF vehicles, aircraft taxiway movements have been considered and phasing plans have been created. Because the phasing for this project is critical to maintaining safety and operations at the airport during construction, adhering to the requirements as laid out in the attached phasing sheets is imperative. To help assist all individuals with this process, it is important that all airport personnel, contractor personnel, and engineering personnel discuss current and upcoming phases during the required weekly construction progress meetings as mentioned in Section 1 of this document.

4. PROTECTION OF NAVIGATION AIDS (NAVAID'S)

The Contractor should be aware of the location of all NAVAID equipment as haul roads are being established in order to ensure that this equipment will be protected for the duration of the project. Should any haul road pass near existing airport NAVAID equipment, the Contractor shall protect these structures from damage. Any damage to any airport NAVAID equipment due to construction activities shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost to the Sponsor.

5. CONTRACTOR ACCESS

The Contractor will be required to submit to Airport staff prior to the commencement of construction, evidence in the form of a certification letter that all of their employees who will have unescorted access to the SIDA have been checked for employment, security, and criminal history for the last ten years. The letter will also certify that these employees meet all security regulations as required by the Sponsor's security program.

During the course of the construction operations, the Contractor will be allowed to utilize a maximum of two (2) airport access "Security Gate" as entrance to the airfield and construction site. Only vehicular access is permitted through the access gates into the construction area, pedestrian access through the access gates is not allowed. The airport shall designate this gate and the associated haul roads. The gate may be opened only for authorized vehicle traffic flow. During times of infrequent construction traffic the gate shall be closed, even when a gate guard is present. At such times as this gate is not guarded, it shall be closed and securely locked. During daylight hours, all authorized vehicles and construction equipment must display either a three-foot by three-foot flag with international orange and white 12-inch squares displayed in full view above the vehicles or lighted rotating beacons. During night time operations only lighted rotating beacons are acceptable. Passengers in any authorized vehicles shall be the responsibility of the Contractor. The "gate guard" shall allow no unauthorized vehicle or person to enter the "air operations" side of the airport without the above stipulated "security clearance." The Contractor and the Contractor's "security gate guard" shall be held duly responsible to uphold the above security stipulations at all times during the progress of the construction project. No deviations from these security measures shall be allowed at any time. Penalties associated with deviations from these security provisions are identified in Section 12 of this document.

A. LOCATION OF STOCKPILED CONSTRUCTION MATERIALS

The Contractor's staging area is shown on the Construction Layout Plan (Sheet G051) and is located to the north of the airports long term parking lot. Any stockpiling activities shall be conducted outside of the all runway/taxiway object free areas as well. Stockpiles shall be identified and lighted in accordance with Section 16. Stockpiles shall be maintained in such manner that they are not a wildlife attractant in accordance with Section 6 and they do not

generate FOD that could be tracked onto active pavement surfaces in accordance with Section 7.

B. VEHICLE AND PEDESTRIAN OPERATIONS

1. Construction Site Parking

Construction employee parking will be outside of the Airport Operations Area (AOA) and outside of the airport perimeter fence.

2. Construction Equipment Parking

Construction equipment parking will be allowed at the contractor's staging area in the location as shown on the Construction Layout Plan (Sheet G051), or at a location approved by the Resident Project Engineer. If the equipment must be parked in an Airport Operations Area (AOA), the equipment must be lighted with a beacon per AC 150/5370-2G. No equipment or material shall be parked or stored in any runway or taxiway safety area or object free area.

3. Access and Haul Roads

The access points to the project are depicted on Sheet G051. The contractor shall keep all access gates closed and locked when not in use. When a gate is open, it shall be appropriately guarded by the contractor to ensure that no unauthorized vehicles or personnel enter airport property.

The Contractor shall obtain approval from the Engineer prior to establishing haul roads within the airport property. Once established, the haul roads shall be utilized for all equipment traffic, and the equipment shall not be allowed to stray or wander away from the established routes. The haul roads shall be the responsibility of the Contractor and shall always be maintained and kept in good order. When required, water shall be applied at the locations and in the amounts necessary to minimize dust and dirt in the air operations area. Since construction operations will be within active airport operation areas, the airport will require additional dust control measures be used on haul roads and the work area in order not to interfere with airport operations. Haul roads that cross any active taxiway, movement areas, non-movement areas or active areas of the ramp shall be kept clean and in good order at all times. The Contractor shall always be prepared to repair any damage caused by the movement of equipment on any of the haul roads at the direction of the Engineer, whether in designated or undesignated areas. After completion of the project, the Contractor shall be required to regrade any unpaved portions of the haul road and to reseed the area with local native grasses to match the existing conditions of the area. The performance of any work as specified by this provision, including watering, maintenance, and repair of the haul roads, shall not be measured and paid for directly, but shall be considered as necessary and incidental to the work. Each day prior to beginning hauling operations the Contractor shall notify the Engineer and Airport of their proposed hauling schedule. Therefore, the Contractor is required to give Airport Personnel 72 hours notice prior to beginning hauling operations, so that the Airport can issue the appropriate NOTAM's.

Establishment of haul roads off of Airport property shall be the sole responsibility of the Contractor.

Contractor movement shall be restricted to the pre-determined access routes as shown on the attached Construction Safety Drawings and within the work area. Work areas shall be delineated with barricades as shown on the phasing drawings. The Contractor shall not operate outside of these areas without approval of the Engineer or Airport Manager.

4. Marking and Lighting of Vehicles

All vehicles operating within the AOA and in the movement/non-movement areas must clearly identify themselves for control purposes. The identification symbols should be a minimum 8-inch block-type characters of a contrasting color and easy to read. They may be applied either by using tape or a water-soluble paint to facilitate removal. Magnetic signs are also acceptable.

To operate within the AOA during daylight hours, the vehicle must have a flag (day only) or yellow flashing light (day or night) attached to it. Any vehicle operation within the AOA during hours of darkness or reduced visibility must be equipped with a yellow flashing light. Flashing lights must be mounted on the uppermost part of the vehicle structure. Flags shall be at least 3-foot by 3-foot square having a checkered pattern of international orange and white squares at least 1 foot on each side. All flashing lights and/or flags shall be kept in good condition and immediately replaced if requested by the Engineer or Airport.

5. Description of Proper Vehicle Operations

Proper vehicle operations are described as confirming to all rules and regulation for driving as directed by the Airport. Any unescorted vehicle operator, operating a vehicle within the AOA, must satisfactorily complete Kirksville Regional Airport's Air Operations Area Driver Training Course, prior to operating a vehicle within the AOA. Access shall be restricted to established haul routes and work areas.

6. Required Escorts

All personnel requiring escort privileges will need to place a request with the Resident Project Representative and Airport Manager at least 72 hours in advance. When any vehicle, other than one that has prior approval from the Airport operator, must travel over any portion of an aircraft movement area, the vehicle will be escorted by a badged representative, and properly identified. To operate in those areas during daylight hours, the vehicle must have a flag (day only) or beacon (day or night) attached to it. Any vehicle operation on the movement areas during hours of darkness or reduced visibility must be equipped with a flashing dome-type beacon.

7. Training Requirements of Vehicle Drivers

The Contractor will not be allowed unescorted access to the AOA. If the Contractor requires access to the AOA, they must request an escort from Airport Manager as discussed above in Section 6.

8. Situational Awareness

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility

of the escort vehicle driver to verify movement/position of all escorted vehicles at any given time.

9. Two-way Radio Communication Procedures

The contractor shall be required to monitor transceiver radios tuned to the Kirksville Regional Airport Common Traffic Advisory Frequency 122.8 MHz. The contractor shall supply adequate radios. Such radios shall be used to obtain proper clearance in regards to the movement of equipment, trucks, etc. within the movement area.

When any construction activities are required within the Taxiway Object Free Area (TOFA) a flagman, who is monitoring a radio, shall be positioned within the work area in such a manner they can clear construction men and equipment from the TOFA during aircraft operation on the associated Taxiway. Prior to any construction activities within a TOFA, such activities must first be coordinated with Airport Operations.

Further, any unusual occurrences in the flight pattern of approaching or departing aircraft shall be acknowledged by all concerned so that operations of the airport and the construction work can be safely carried on at all times.

10. Maintenance of the Secured Area of the Airport

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Throughout the duration of construction, it is anticipated that there will only be two access points for construction personnel. These access points will consist of existing gates located within the existing perimeter fence as shown in the Construction Layout and Phasing Plans. The gates will be equipped so that they can be securely closed and locked to prevent unauthorized access. During hauling activities, a gate guard will be positioned at the gate. During times of infrequent hauling the gate shall be closed, even when the gate guard is present.

Because the Airport is subject to 49 CFR Part 1542, *Airport Security*, even during construction, the Airport must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

11. Construction Site Safety

All personnel working on the construction site, including gate guards, are recommended to have personal protective equipment on at all times. This includes but is not limited to vests, hard hats, hearing protection, eye protection, and radios.

6. WILDLIFE MANAGEMENT

All wildlife management within the Airport Operations Area shall be accomplished in conformance to Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, and Certalert 98-05, *Grasses Attractive to Hazardous Wildlife*. In general, the Contractor must carefully control and continuously remove waste or loose material that might attract wildlife.

A. TRASH

The Contractor is responsible to complete a daily inspection or more frequently, if deemed necessary by the Resident Project Representative, of the construction site (including the Contractor's Staging Area) for any trash or objects that might attract wildlife.

B. STANDING WATER

Because standing water can attract wildlife, the Contractor is responsible to complete a daily inspection of the construction site for any standing water. With the discretion of the Resident Project Representative, the Contractor shall remove this hazard.

C. TALL GRASS AND SEEDS

The Contractor will install soil, seeding and hydromulch as specified in the *T-901 Seeding* specification for this project or as directed by the Engineer.

D. POORLY MAINTAINED FENCING AND GATES

The Contractor shall be required to maintain all fences and gates throughout the duration of the project, to the satisfaction of the Resident Project Representative.

E. DISRUPTION OF EXISTING WILDLIFE HABITAT

The Contractor shall notify the Resident Project Representative when a wildlife sighting has occurred on the project site to mitigate any disruption to the existing wildlife habitat.

7. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

The presence of FOD on the apron is a significant safety concern, as debris can be ingested into an aircraft's engine causing extensive damage, or can be launched across the apron by jet blast, potentially causing bodily injury or damaging other aircraft. Materials capable of creating FOD must be continuously removed during the construction project. The Contractor is required to keep all taxiways and aprons, open to aircraft free from FOD at all times. The Contractor is required to maintain FOD control continually and to the satisfaction of the Resident Project Representative. FOD Control measures shall include the use of power brooms, FOD boss, and manual removal as well as any other means deemed necessary. Prior to opening any pavement to aircraft, the Contractor shall conduct a sweep of the pavement to verify that it is FOD free. The apron areas and Taxiway A to the south of the limits of construction will be a high priority area during this project as commercial aircraft will be in the vicinity of this area on a daily basis throughout most of the construction process.

8. HAZARDOUS MATERIAL (HAZMAT) MANAGEMENT

Although hazardous material is not anticipated to be present on this project, if hazardous material is encountered, the Contractor shall inform the Resident Project Representative and Airport immediately. Additionally, the Contractor shall always have available Material Safety Data Sheets or Product Safety Data Sheets for all Hazardous Materials utilized on-site, such as fuel, and readily available. Immediate notification of the Airport is required for any Hazardous Material Spill.

9. NOTIFICATION OF CONSTRUCTION ACTIVITIES

Prior to commencing any construction activities as well as prior to beginning a new construction phase the Contractor shall notify the Resident Project Representative and Airport Operations 72 hours in advance. During construction activities the Contractor shall immediately notify the Resident Project Representative and Airport Operations of any conditions that may adversely affect the operational safety of the Airport.

A. LIST OF RESPONSIBLE REPRESENTATIVES/POINTS OF CONTACT

Agency Name	Type of Agency	Telephone No.
Airport Emergency	Aircraft Rescue and Fire Fighting	(660) 665-5020
Kirksville Police Department	Police Department	(660) 785-6945 Or 911
Kirksville Fire Department	Fire Department	(660) 665-3734 Or 911
Complete Family Medicine Urgent Care	Urgent Care	(660) 665-7575 Or 911
Northeast Regional Medical Center	Hospital	(660) 785-1000 Or 911
Airport Administrative	Airport Administration	(660) 665-5020
Kirksville Airport Operations	Airport Operations	(660) 665-5020
Jviation, Inc. Kevin Scherr	Project Manager	(720) 527-2927 Cell

B. NOTICES TO AIRMEN (NOTAM)

Only Airport Operations may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway or taxiway. Airport Operations must coordinate the issuance, maintenance, and cancellation of NOTAMs about Airport conditions resulting from construction activities 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 Contractor must notify the Resident Project Representative, or designated representative, when scheduling/scoping for the project has changed or required a pavement closure that would require a modification or addition to the NOTAMs.

EMERGENCY NOTIFICATION PROCEDURES

In an event of an emergency, the Contractor shall notify the Resident Project Representative and Airport staff. If necessary, the Contractor shall contact 911 and Airport Emergency.

C. COORDINATION WITH ARFF PERSONNEL

In an event that the Contractor must coordinate construction activities with ARFF Personnel, the Contractor will notify Airport staff or Resident Project Representative. The Airport staff or Resident Project Representative will be responsible to notify the event to ARFF Personnel. There are no planned interruptions to water lines associated with this project.

D. NOTIFICATION TO THE FAA

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.

Regarding any NAVAID's damage, the Airport shall contact 1-866-432-2622.

The anticipated impacts to Airport or FAA owned NAVAIDS occur during Schedule I, Phase 1, 2 and 3 of the project when Runway 18/36 will be limited and/or shut down. The Contractor will be responsible for any damage to any other NAVAIDS. If a shutdown of a NAVAID is required of more than 24 hours or more than 4 hours daily on consecutive days a minimum notice of 45 days must be given to the FAA ATO/Technical Operations prior to the shutdown commencing.

10. INSPECTION REQUIREMENTS

A. DAILY (OR MORE FREQUENT) INSPECTIONS

Inspections shall be conducted daily and more frequently if necessary by the Resident Project Representative to ensure conformance with this document. The checklist provided at the end of this report was copied from FAA AC 150/5370-2G Appendix 4, *Construction Project Daily Safety Inspection Checklist*. This checklist shall be completed by the Contractor to the Engineer's satisfaction and the Contractor shall submit a copy of all the completed checklists to the Engineer and the Airport Manager. The Contractor should fill out this checklist everyday construction operations occur on this project. Any deficiencies identified during inspection or otherwise shall be remedied immediately.

B. FINAL INSPECTIONS

Final inspections shall be conducted after every construction phase is complete as detailed in Section 2 of this document. The final inspection should be completed with the Contractor, Resident Project Representative, and Airport Manager.

11. UNDERGROUND UTILITIES

Prior to beginning excavation activities the Contractor shall notify the Resident Project Representative and Airport Operations at least 3 working days prior to the scheduled excavation. The FAA shall attempt to locate all of their underground cables that are located in the vicinity of the work areas, prior to construction in the area. The Contractor shall attempt to locate the Sponsor's underground cables and other sub-surface utilities prior to construction. Damage to the underground cables, whether FAA's or Sponsor's, through negligence on the part of the Contractor will require replacement by the Contractor at no cost to the Sponsor. Any splicing or replacing of damaged cable shall meet current FAA specifications. Damage to other underground utilities through Contractor's negligence shall be repaired according to the relevant utility's standards and at no cost to the Sponsor. In the event of an accidental utility disruption Airport Operations will be contacted at the numbers listed in Section 9.A.

12. PENALTIES

Penalties are based on the Airport's security policies. The Contractor is responsible for any penalties that the Airport may distribute.

13. SPECIAL CONDITIONS

The contractor shall provide the necessary dust control to ensure that dust from the haul routes and construction areas is kept to a minimum.

14. RUNWAY AND TAXIWAY VISUAL AIDS

A. GENERAL

A section of Runway 18/36 and Taxiway's A and B will be closed during this project. The Contractor will need to install approved lighted, low-profile barricades to close off the various construction areas. In addition to the barricades, the Contractor will need to cover the taxiway and runway lights/signs with an approved method along the closed section of runway and taxiway.

B. MARKINGS

The procedure to close off the apron/taxiway for construction shall consist of placing barricades and flashers on the perimeter of the construction. For the runway/taxiway intersections, a closed taxiway "X" and low-profile barricades located outside of the RSA, will be utilized, as shown in the phasing plan sheets at the end of this document or as directed by the Engineer. The procedure to close off the runway for construction shall consist of lighted runway closure "X's" and low-profile barricades located outside the RSA, will be utilized, as shown in the phasing plan sheets at the end of this document or as directed by the Engineer.

C. LIGHTING AND VISUAL NAVAIDS

A section of Runway 18/36 and Taxiway's A and B will be closed during a portion of this project. The Contractor will need to install approved lighted, low-profile barricades during the various phases of work. In addition to the barricades, the contractor will need to cover the taxiway and runway lights with an approved method along the closed section of the taxiway and runway.

D. SIGNS, TEMPORARY, INCLUDING ORANGE CONSTRUCTION SIGNS, AND PERMANENT SIGNS

In addition to erecting barricades and covering lights, the Contractor will need to cover any taxiway and/or runway signs that lead to closed pavements during construction.

15. MARKING AND SIGNS FOR ACCESS ROUTES

All required signs and markings shall conform to Advisory Circular 150/5340-18, *Standard for Airport Sign Systems*, and to the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), to the extent possible. Signs adjacent to areas used by aircraft must comply with the frangible requirements as stated in Advisory Circular, 150/5220-23 *Frangible Connections*. The location and design of any signs will be directed by the Engineer or Airport Manager and the signs shall be provided and installed by the Contractor.

16. HAZARD MARKINGS AND LIGHTINGS

A. PURPOSE

The hazard marking and lighting prevents pilots from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. Prior to construction on or adjacent to any taxiway or apron, the Contractor shall, upon approval by the Engineer, close the taxiway and/or apron, in accordance with the specific phasing plan associated with that phase, prior to beginning work. The Contractor shall be responsible for clearly marking and defining the closed taxiways by use of warning lights, barricades, flags and closed taxiway or runway markings in conformance with Advisory Circular 150/5370-2G. The Contractor shall be responsible for maintaining these barricades and keeping them clearly visible at all times. The Contractor's individuals responsible, as well as their contact information, for the maintenance of the hazard marking and lighting equipment are listed in Section 9 A. of this document.

Specific marking and lighting equipment details, location and other pertinent information regarding hazard marking materials including low-profile barricades are shown on the Construction Safety Drawings, attached to the back of this document. Please note that each phase may have unique details. Additionally, prior to any deviations in location or type of hazard marking materials shall be coordinated with the Resident Project Representative and Airport Operations.

B. EQUIPMENT

Approved low-profile barricades are to identify and define the limits of construction and hazardous areas on airports. Physical requirements and spacing of the barricades are specified in the construction drawings for this project. The barricades must be weighted down per the manufacturer's recommendations to prevent the barricades from moving due to wind or jet blast.

The flashing lights on the approved barricades must meet the luminance requirement of the State Highway Department. The flashing lights must be red or an approved equal.

17. PROTECTION OF RUNWAY AND TAXIWAY AREAS

A. RUNWAY SAFETY AREA (RSA)

The Kirksville Airport defines the Safety Area for Runway 18/36 as the area that is within 250 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the RSA of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

B. RUNWAY OBJECT FREE AREA (ROFA)

The Kirksville Regional Airport defines the Object Free Area for Runway 18/36 as the area that is within 400 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the ROFA of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

C. TAXIWAY SAFETY AREA (TSA)

The Kirksville Regional Airport defines the Safety Area for Taxiway A as the area that is within 39.5 feet from the centerline of Taxiway A. Construction activities associated with Schedules

II and III will be completed within the TSA of Taxiway's A and B. During these construction activities Taxiway A will be closed from Taxiway C to the North, Taxiway B will be closed from the Apron to Runway 18/36.

Open trenches and excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, cover the excavations appropriately.

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting aircraft rescue and fire fighting equipment, snow removal equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

D. TAXIWAY OBJECT FREE AREA (TOFA)

The Kirksville Regional Airport defines the Object Free Area for Taxiway A as the area that is within 65.5 feet from the centerline of Taxiway A. Construction activities associated with Schedules II and III will be completed within the TOFA of Taxiway's A and B. During these construction activities Taxiway A will be closed from Taxiway C to the North, Taxiway B will be closed from the Apron to Runway 18/36. No work is permitted within the TOFA of any active pavement.

E. OBSTACLE FREE ZONE (OFZ)

The Kirksville Regional Airport defines the Obstacle Free Zone for Runway 18/36 as the area that is within 200 feet from the centerline of Runway 18/36. Construction activities in Schedules I and III will be completed within the OFZ of Runway 18/36. During construction activities in these Schedules Runway 18/36 will be closed.

Personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If it is necessary to enter the OFZ, it would be necessary to coordinate with the FAA

F. RUNWAY APPROACH/DEPARTURE SURFACES

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in Appendix 2, "Threshold Siting Requirement," of Advisory Circular 150/5300-13. **NEED TO REVIEW THIS SECTION AS WE WILL BE UTILIZING A DISPLACED THRESHOLD.**

18. OTHER LIMITATIONS ON CONSTRUCTION

A. PROHIBITIONS

The use of open flame welding or torches is prohibited unless adequate fire safety precautions are provided and the Airport Manager has approved their use. The use of flare pots within the AOA is prohibited at all times. The use of electrical blasting caps is prohibited on or within 1,000 feet of the Airport property.

B. RESTRICTIONS

Construction suspension may be required during specific Airport Operations. Project areas may be worked on simultaneously only if approved by the Resident Project Representative

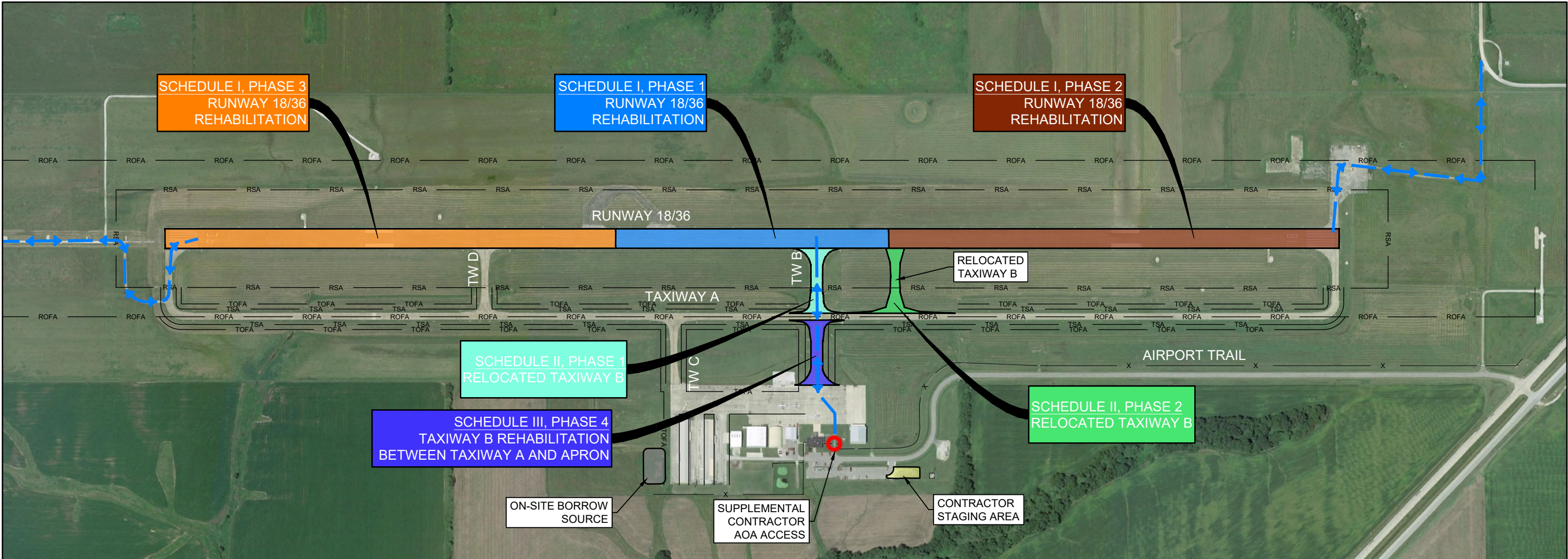
and Airport Operations. Night construction may only be performed if approved by the Resident Project Representative and Airport Operations. Construction operations shall only be allowed in weather conditions compliant with the project specifications.

19. DUST CONTROL

The Contractor is responsible for controlling dust from the construction site at all times. The Contractor shall have a water truck and operator available 24 hours a day to control dust since the project's locations is near active runways, taxiways, and aprons. It is critical for the contractor to keep dust to an absolute minimum both during construction and after construction until the exposed surfaces contain suitable vegetation. The Contractor shall provide the Resident Project Representative and Airport Operations with a contact for 24-hour dust control.

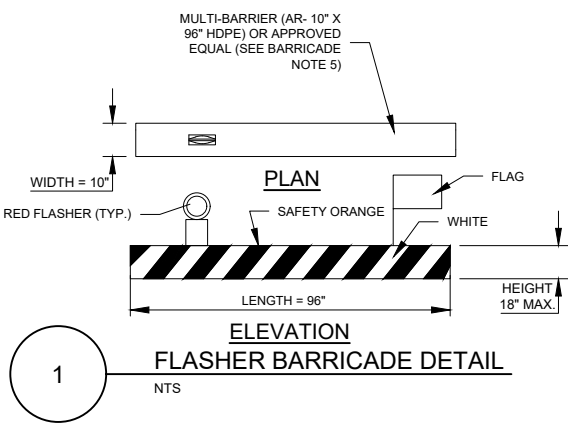
APPENDIX A

CONSTRUCTION SAFETY DRAWINGS



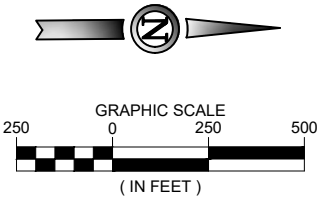
PROJECT SCHEDULE (115 CALENDAR DAYS)		
SCHEDULE / PHASE	DURATION	0 20 40 60 80 100 120
SCHEDULE I	95 CALENDAR DAYS	
PHASE 1	20 CALENDAR DAYS	
PHASE 2	60 CALENDAR DAYS	
PHASE 3	15 CALENDAR DAYS	
SCHEDULE II	75 CALENDAR DAYS	
PHASE 1	15 CALENDAR DAYS	
PHASE 2	60 CALENDAR DAYS	
SCHEDULE III	15 CALENDAR DAYS	
PHASE 4	15 CALENDAR DAYS	

SAFETY & OBJECT FREE AREAS	
RUNWAY 18/36	
RUNWAY SAFETY AREA (RSA)	250' FROM RW CENTERLINE
RUNWAY OBJECT FREE AREA (ROFA)	400' FROM RW CENTERLINE
TAXIWAYS	
TAXIWAY SAFETY AREA (TSA)	39.5' FROM TW CENTERLINE
TAXIWAY OBJECT FREE AREA (TOFA)	65.5' FROM TW CENTERLINE



- FLASHER BARRICADE NOTES**
- FLASHERS TO BE BATTERY OPERATED. LENS TO BE RED AND BE ABLE TO ROTATE 90°.
 - FACING OF LOW-PROFILE BARRICADE TO BE COVERED WITH REFLECTIVE MATERIAL.
 - LOW-PROFILE BARRICADES TO BE PLACED WITH 10' INTERVALS ALONG OPERATIONAL PAVEMENT, ADJACENT TO CONSTRUCTION, AS DIRECTED BY THE ENGINEER.
 - FLASHERS SHALL BE SECURED TO THE BARRICADES, AS APPROVED BY AIRPORT OPERATIONS. ALTERNATE FLASHER LENSES SO THAT EVERY OTHER LENS IS ROTATED 90°.
 - LOW-PROFILE BARRICADES SHALL BE OF LOW MASS, EASILY COLLAPSIBLE UPON CONTACT WITH AN AIRCRAFT OR ANY OF ITS COMPONENTS, AND WEIGHTED OR STURDILY ATTACHED TO THE SURFACE. IF AFFIXED TO THE SURFACE, THE BARRICADE MUST BE FRANGIBLE AT GRADE LEVEL OR LOW AS POSSIBLE, BUT NOT TO EXCEED 3 INCHES ABOVE THE GROUND. THE CONTRACTOR IS TO REPAIR ANY SURFACE DAMAGE IF BARRICADE IS AFFIXED TO THE SURFACE.
 - THE CONTRACTOR SHALL MAINTAIN ALL BARRICADES AT ALL TIMES. CONTRACTOR SHALL ALSO PROVIDE THE AIRPORT SPARE BATTERIES AND LIGHT BULBS FOR EMERGENCY BACK-UP.
 - FLASHER BARRICADES WILL BE REQUIRED ALONG THE EDGE OF ANY VERTICAL DROP OFF GREATER THAN 3". AIRPORT OPERATIONS WILL ISSUE NOTAM TO ADVISE AIRCRAFT OF THIS CONDITION.

PHASING LEGEND	
	CONTRACTOR HAUL ROUTE (2 WAY TRAFFIC)
	RSA RUNWAY SAFETY AREA
	ROFA RUNWAY OBJECT FREE AREA
	TSA TAXIWAY SAFETY AREA
	TOFA TAXIWAY OBJECT FREE AREA
	RPZ RUNWAY PROTECTION ZONE
	AOA FENCE
	FLASHER BARRICADE
	RUNWAY CLOSURE MARKER
	TAXIWAY CLOSURE MARKER
	FLAGMAN / GATE GUARD
	CONTRACTOR GATE ACCESS



ISSUED FOR BID		
THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:		
BRYAN S. GREGORY	PE-2006019659	01/31/21
NAME	REG. NO.	DATE
FOR AND ON BEHALF OF JVIATION , INC.		

JVIATION®

KIRKSVILLE
REGIONAL AIRPORT
KIRKSVILLE, MISSOURI



DES: D.W.C.
DR: F.V.
CH: C.L.G.
APP: B.S.G.

ISSUE RECORD				
NO.	BY	DATE	DESCRIPTION	
1	B.S.G.	01/31/21	ISSUED FOR BID	

RUNWAY 18/36 AND
TAXIWAY B
REHABILITATION

CONSTRUCTION LAYOUT PLAN

MoDOT PROJ. NO.
20-028A-1

JVIATION PROJ. NO.
2020.IRK.01

SHEET NAME
G050
SHEET NO.
10 of 61

ALL COORDINATION WILL TAKE PLACE THROUGH THE RESIDENT ENGINEER AND KIRKSVILLE REGIONAL AIRPORT (IRK) OPERATIONS MANAGER. NO CLOSURES WITHIN THE MOVEMENT AREAS WILL BE PERMITTED WITHOUT A NOTAM IN PLACE FOR EACH SPECIFIC CLOSURE. PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL GIVE 72 HOURS ADVANCE NOTICE TO THE RESIDENT ENGINEER AND AIRPORT OPERATIONS FOR FILING OF ALL NOTAMS.

ANY CHANGES TO SCOPE OR SCHEDULE MUST BE NOTIFIED TO THE RESIDENT ENGINEER AND IRK OPERATIONS MANAGER. ALL PARTIES WILL EVALUATE THE IMPACT OF THE CHANGE AND WILL DETERMINE THE MEASURES NEEDED TO MAINTAIN A SAFE CONSTRUCTION SITE.

AIRCRAFT USE OF AREAS NEAR THE CONTRACTOR'S WORK SHOULD BE CONTROLLED TO MINIMIZE DISTURBANCE TO THE CONTRACTOR'S OPERATION.

THE CONTRACTING OFFICER, AIRPORT OPERATOR, OR OTHER DESIGNATED AIRPORT REPRESENTATIVE MAY ORDER THE CONTRACTOR TO SUSPEND OPERATIONS; MOVE PERSONNEL, EQUIPMENT, AND MATERIALS TO A SAFE LOCATION; BARRICADE ANY OPEN TRENCHES AND STAND BY UNTIL AIRCRAFT USE IS COMPLETED.

CONTRACTOR TO NOTIFY RESIDENT ENGINEER AND IRK OPERATIONS
MANAGER IF A CHANGE IN SCHEDULE IS NEEDED.

ALL WORK WITHIN AIRPORT OPERATIONS AREA (AOA) SHALL CONFORM TO ADVISORY CIRCULAR 150/5370-2G, OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION.

4. PROTECTION OF NAVIGATION AIDS (NAVAIDS)

DURING CONSTRUCTION, NO NAVAID EQUIPMENT WILL BE RELOCATED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING NAVAIDS AND WILL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE AIRPORT.

CONTRACTOR SHALL NOT HAVE UNESCORTED ACCESS TO THE AOA. WHENEVER CONTRACTOR IS WORKING IN OR NEAR THE AOA, CONTRACTOR SHALL HAVE ESCORT PROVIDED BY AIRPORT OPERATIONS AT ALL TIMES. CONTRACTOR SHALL GIVE AIRPORT OPERATIONS 72 HOUR NOTICE WHEN AN ESCORT IS REQUIRED.

ALL VEHICLES AND EQUIPMENT OPERATING IN THE AOA MUST BE IDENTIFIED CLEARLY WITH 8-INCH (MINIMUM) BLOCK-TYPE CHARACTERS OF A CONTRASTING COLOR AND EASY TO READ. IN ADDITION, VEHICLES MUST DISPLAY IDENTIFICATION MEDIA, AS SPECIFIED IN THE APPROVED AIRPORT SECURITY PLAN.

ALL APPROVED DRIVERS MUST ATTEND AND PASS THE AIRPORT DRIVING TRAINING COURSE. THIS TRAINING IS REQUIRED FOR ALL PERSONNEL THAT ARE REQUIRED TO EITHER BE BADGED OR PLAN ON OPERATING A VEHICLE IN THE AOA.

CONTRACTOR PERSONNEL MAY OPERATE IN THE MOVEMENT AREA WITHOUT TWO-WAY RADIO COMMUNICATION PROVIDED A NOTAM IS ISSUED CLOSING THE AREA AND THE AREA IS PROPERLY MARKED TO PREVENT INCURSIONS. CONTINUOUS MONITORING IS REQUIRED ONLY WHEN EQUIPMENT MOVEMENT IS NECESSARY IN CERTAIN AREAS.

CONTRACTOR, SUBCONTRACTOR, AND SUPPLIER EMPLOYEES OR ANY
UNAUTHORIZED PERSONS ARE RESTRICTED FROM ENTERING AN
AIRPORT AREA THAT WOULD BE HAZARDOUS.

CONTRACTOR SHALL ADHERE TO ALL WILDLIFE MANAGEMENT PRACTICES AS STATED IN ADVISORY CIRCULAR 150/5200-33C, HAZARDOUS WILDLIFE ATTRACTIONS ON OR NEAR AIRPORTS, AND CERTALERT 98-08, GRASSES ATTRACTIVE TO HAZARDOUS WILDLIFE.

CONTRACTOR SHALL MAINTAIN ALL FENCES AND GATES THROUGHOUT THE PROJECT TO THE SATISFACTION OF THE RESIDENT ENGINEER.

CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER WHEN A WILDLIFE SIGHTING HAS OCCURRED ON THE PROJECT SITE.

CONTRACTOR SHALL KEEP ALL PAVEMENTS IN THE AOA INCLUDING APRONS, TAXIWAYS, AND RUNWAYS FREE FROM FOD AT ALL TIMES TO PREVENT ANY DEBRIS FROM BEING INGESTED INTO AN AIRCRAFT'S ENGINE OR ANY DEBRIS FROM BEING LAUNCHED DUE TO JET BLAST.

CONTRACTOR IS REQUIRED TO CONTINUOUSLY MONITOR AND MAINTAIN FOD TO THE SATISFACTION OF THE RESIDENT ENGINEER.

PRIOR TO OPENING ANY PAVEMENT TO AIRCRAFT, THE CONTRACTOR, RESIDENT ENGINEER, AND AIRPORT OPERATIONS SHALL CONDUCT A SWEEP OF THE PAVEMENT TO VERIFY THAT THE PAVEMENT IS FREE FROM FOD.

ANY CHANGES TO SCOPE OR SCHEDULE MUST BE NOTIFIED TO THE RESIDENT ENGINEER AND IRK OPERATIONS MANAGER SO THAT NOTAMS CAN BE ISSUED, MAINTAINED, AND CANCELED. IN AN EVENT OF AN EMERGENCY, CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER, IRK OPERATIONS MANAGER, AND AIRPORT EMERGENCY.

THE CONTRACTOR, RESIDENT ENGINEER AND AIRPORT OPERATOR MUST PERFORM ONSITE INSPECTIONS THROUGHOUT THE PROJECT, WITH IMMEDIATE REMEDY OF ANY DEFICIENCIES, WHETHER CAUSED BY NEGLIGENCE, OVERSIGHT, OR SCOPE CHANGE.

CONTRACTOR SHALL COMPLETE A FINAL INSPECTION FOR SAFETY ON THE PROJECT SITE AT THE END OF EACH PHASE.

RUNWAY THRESHOLDS MUST PROVIDE AN UNOBSTRUCTED APPROACH SURFACE OVER EQUIPMENT AND MATERIALS. (REFER TO CHAPTER 3 IN ADVISORY CIRCULAR 150/5300-13A OR CURRENT VERSION, AIRPORT DESIGN, FOR GUIDANCE).

FLASHER BARRICADES, CLOSED 'X' MARKINGS AND RUNWAY CLOSURE MARKERS (RCMS) ARE TO BE PLACED AS DETAILED IN THE PLANS AND IN ALL DESIGNATED AREAS AS SHOWN ON THE CONSTRUCTION SAFETY DRAWINGS.

APPROVED FLASHER BARRICADES SHALL BE PROVIDED AND MAINTAINED BY THE CONTRACTOR.

CLOSED 'X' MARKINGS AND RUNWAY CLOSURE MARKERS SHALL BE PROVIDED BY THE CONTRACTOR AND MAINTAINED BY THE CONTRACTOR.

CONTRACTOR TO COVER ALL TAXIWAY EDGE LIGHTS, TAXIWAY SIGNS, RUNWAY SIGNS, AND APRON EDGE LIGHTS FOR AREAS CLOSED BY NOTAM TO THE APPROVAL OF THE RESIDENT ENGINEER.

ALL REQUIRED SIGNS AND MARKINGS SHALL CONFORM TO ADVISORY CIRCULAR 150/5340-18G, STANDARD FOR AIRPORT SIGN SYSTEMS, OR THE FEDERAL HIGHWAY ADMINISTRATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

ALL SIGNS ADJACENT TO AREAS USED BY AIRCRAFT MUST COMPLY WITH THE FRANGIBLE REQUIREMENTS AS STATED IN ADVISORY CIRCULAR 150/5220-23, FRANGIBLE CONNECTIONS.

PRIOR TO CLOSING ANY AREAS IN THE AOA TO AIRCRAFT OR EMERGENCY TRAFFIC, CONTRACTOR MUST CLEARLY DEFINE CLOSED AREAS WITH WARNING LIGHTS, BARRICADES, CLOSED 'X' MARKINGS, RCMS, AND FLAGS TO THE APPROVAL OF THE RESIDENT ENGINEER. CONTRACTOR TO REFER TO CONSTRUCTION SAFETY DRAWINGS.

HAZARDOUS AREAS ON THE MOVEMENT AREA WILL BE MARKED WITH FLASHER BARRICADES. THESE BARRICADES RESTRICT ACCESS AND MAKE HAZARDS OBVIOUS TO AIRCRAFT, PERSONNEL, AND VEHICLES. DURING PERIODS OF LOW VISIBILITY AND AT NIGHT, IDENTIFY HAZARDOUS AREAS WITH RED FLASHING LIGHTS.

OPEN TRENCHES AND EXCAVATIONS MUST BE PROMINENTLY MARKED WITH RED OR ORANGE FLAGS AND LIGHTS AS APPROVED BY THE RESIDENT ENGINEER.

OBSTACLE FREE ZONE- CONTRACTOR TO PREVENT PERSONNEL, MATERIAL, AND/OR EQUIPMENT FROM PENETRATING THE OBSTACLE FREE ZONE AS DEFINED IN ADVISORY CIRCULAR 150/5300-13A OR CURRENT VERSION.

CONTRACTOR SHALL ADHERE TO AIRPORT SECURITY REQUIREMENTS AT ALL TIMES. AIRPORT FAMILIARIZATION REQUIREMENTS ARE MANDATORY.

PROHIBITING OPEN-FLAME WELDING OR TORCH CUTTING OPERATIONS UNLESS ADEQUATE FIRE SAFETY PRECAUTIONS ARE PROVIDED AND THESE OPERATIONS HAVE BEEN AUTHORIZED BY THE AIRPORT OPERATOR (AS TAILORED TO CONFORM TO LOCAL REQUIREMENTS AND RESTRICTIONS).

PROMINENTLY MARKING OPEN TRENCHES, EXCAVATIONS, AND STOCKPILED MATERIALS AT THE CONSTRUCTION AND LIGHTING THESE OBSTACLES DURING HOURS OF RESTRICTED VISIBILITY AND DARKNESS.

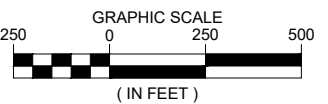
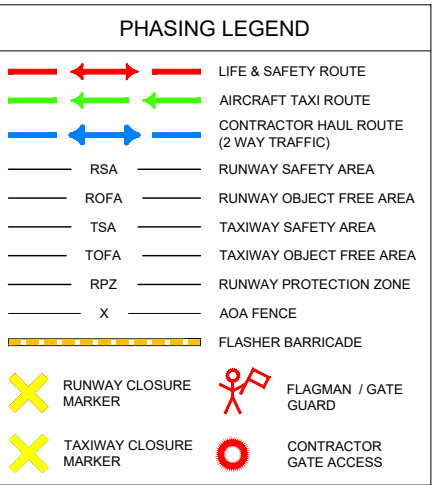
MARKING AND LIGHTING CLOSED, DECEPTIVE, AND HAZARDOUS AREAS ON AIRPORTS, AS APPROPRIATE. CONSTRAINING STOCKPILED MATERIAL TO PREVENT ITS MOVEMENT AS A RESULT OF THE MAXIMUM ANTICIPATED AIRCRAFT BLAST AND FORECAST WIND CONDITIONS.

NO USE OF TALL EQUIPMENTS (CRANES, CONCRETE PUMPS, AND SO ON) UNLESS A FAA 7460-1 DETERMINATION LETTER IS ISSUED FOR SUCH EQUIPMENT.

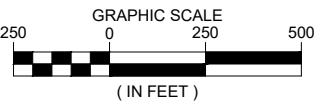
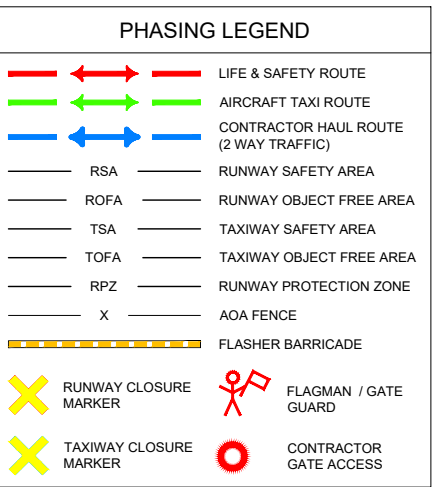
NO USE OF ELECTRICAL BLASTING CAPS ON OR WITHIN 1,000' OF THE AIRPORT PROPERTY.

NO USE OF FLARE POTS WITHIN THE AOA

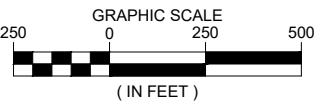
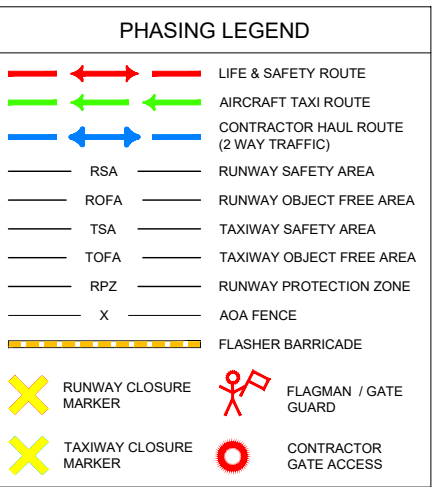
CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST FROM THE CONSTRUCTION SITE AT ALL TIMES. CONTRACTOR SHALL HAVE A WATER TRUCK AND OPERATOR AVAILABLE 24 HOURS A DAY TO CONTROL DUST. THE PROJECT'S LOCATION IS NEAR ACTIVE RUNWAYS AND HIGHWAYS AND IS IN A LOCATION THAT EXPERIENCES HIGH WIND. IT IS CRITICAL FOR THE CONTRACTOR TO KEEP DUST TO AN ABSOLUTE MINIMUM BOTH DURING CONSTRUCTION, AND AFTER CONSTRUCTION UNTIL THE EXPOSED SURFACES CONTAIN SUSTAINABLE VEGETATION. CONTRACTOR SHALL PROVIDE THE RESIDENT ENGINEER AND AIRPORT OPERATIONS WITH A CONTACT FOR 24 HOUR DUST CONTROL.



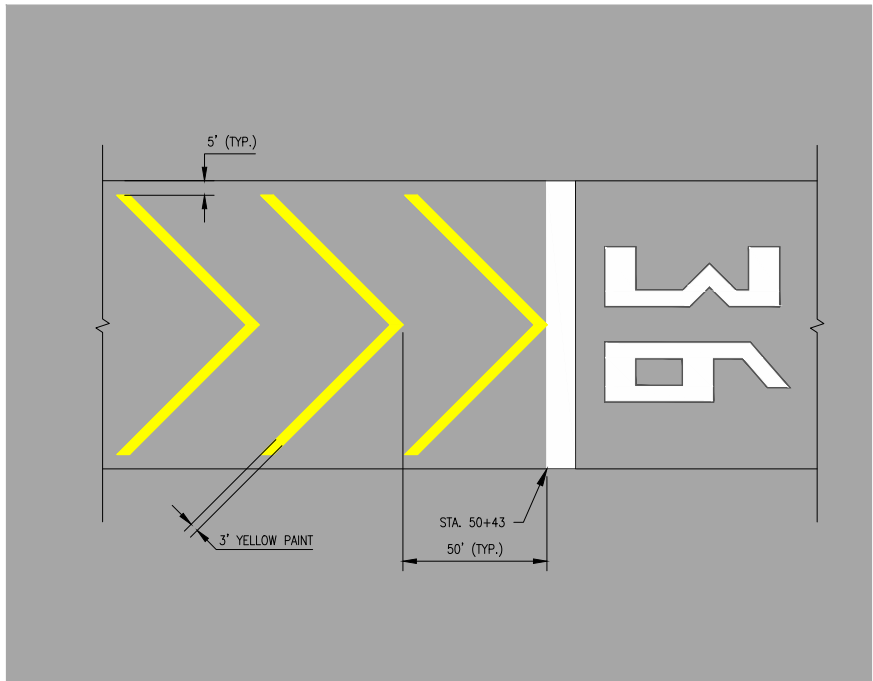
ISSUED FOR BID		
THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:		
BRYAN S. GREGORY	PE-2006019659	01/31/21
NAME	REG. NO.	DATE
FOR AND ON BEHALF OF JVIATION , INC.		



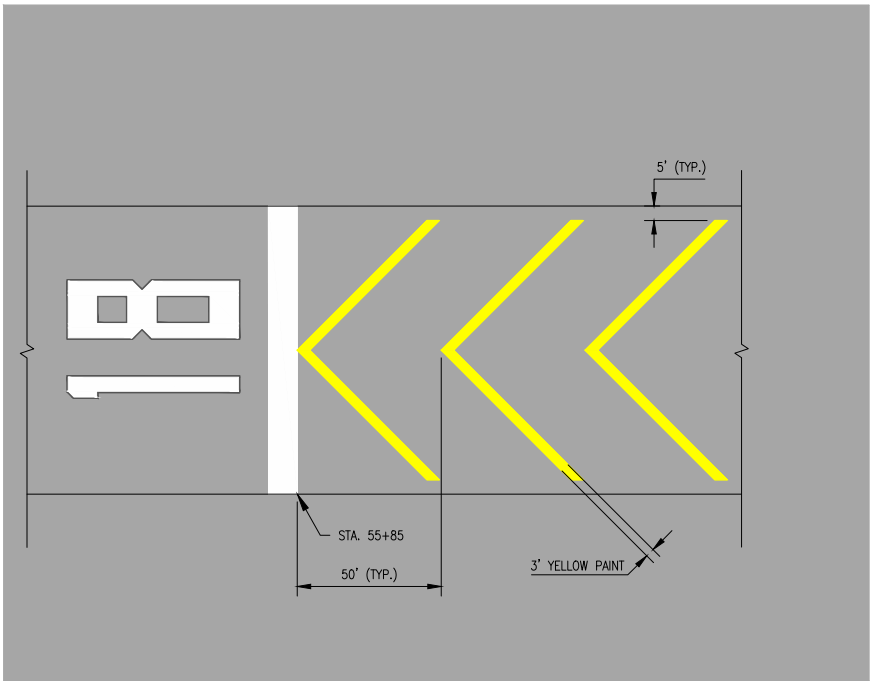
ISSUED FOR BID		
THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:		
BRYAN S. GREGORY	PE-2006019659	01/31/21
NAME	REG. NO.	DATE
FOR AND ON BEHALF OF JVIATION , INC.		



ISSUED FOR BID		
<p>THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:</p>		
BRYAN S. GREGORY	PE-2006019659	01/31/21
NAME	REG. NO.	DATE
FOR AND ON BEHALF OF JVIATION , INC.		

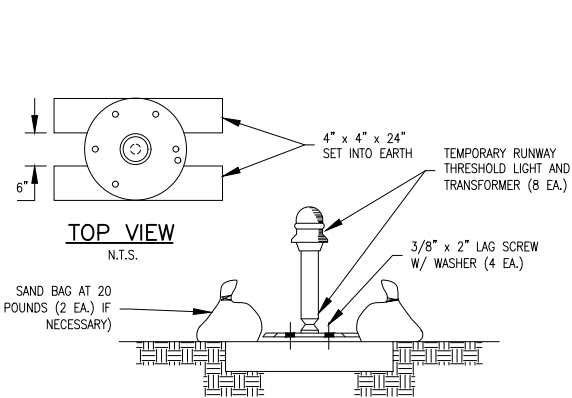


1
G057
PAINTED RUNWAY 36 DISPLACED THRESHOLD
N.T.S.

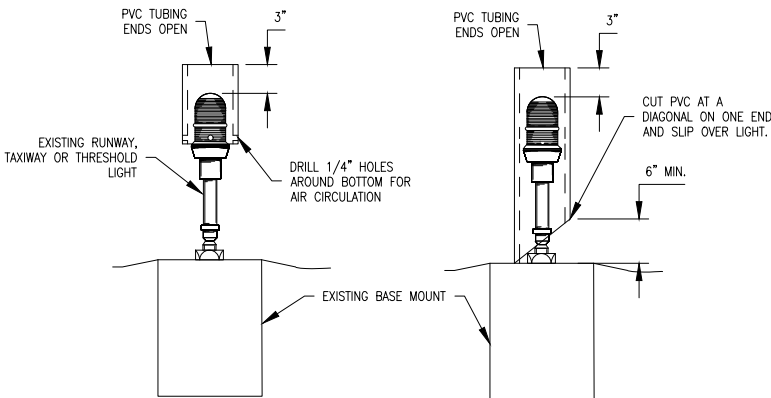


1A
G056
PAINTED RUNWAY 18 DISPLACED THRESHOLD
N.T.S.

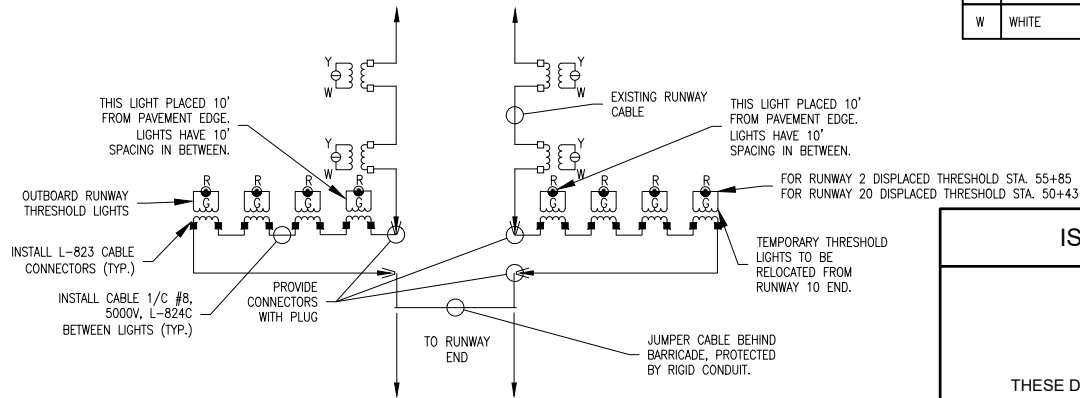
- TEMPORARY DISPLACED THRESHOLD NOTES**
- THE CONTRACTOR SHALL PROVIDE THE RESIDENT ENGINEER AND THE AIRPORT A MINIMUM 48-HOUR NOTICE PRIOR TO INSTALLING THE DISPLACED THRESHOLD.
 - THE MARKING OBLITERATION FOR THE TEMPORARY DISPLACED THRESHOLD SHALL BE ACCOMPLISHED BY BLACK PAINT, WATER BLASTING OR APPROVED METHOD. ANY DAMAGE TO EXISTING PAINT MARKINGS SHALL BE REPAINTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE COST OF OBLITERATING THE MARKINGS SHALL BE INCIDENTAL TO ITEM L400.
 - THE CONTRACTOR SHALL COORDINATE DISPLACED THRESHOLD INSTALLATION WITH THE AIRPORT POINT OF CONTACT REGARDING SHUTOFF OR ADJUSTMENTS TO BE PERFORMED BY FAA TECHNICIANS TO FAA OPERATED NAVIGATIONAL AIDS.
 - RDR SIGNS SHALL BE COVERED FOR AIRCRAFT LANDING ON RUNWAY 18/36 AS REQUIRED BY FAA ADVISORY CIRCULAR 150/5370-2G FOR TEMPORARY DISPLACED RUNWAY THRESHOLDS.
 - THE WHITE AND YELLOW PAINT SHALL BE APPLIED AS A TEMPORARY COAT AND INCLUDE GLASS BEADS PER SPECIFICATION P-620. BLACK PAINT SHALL NOT INCLUDE GLASS BEADS.
 - COST FOR THE TEMPORARY DISPLACED THRESHOLD SHALL BE PAID BY LUMP SUM UNDER PAY ITEM L400. APPROXIMATE QUANTITIES (CONTRACTOR TO VERIFY BEFORE ORDERING) INCLUDE:
 - BLACK PAINT: RUNWAY 2 25,000 SF, RUNWAY 20 35,000 SF
 - WHITE PAINT: RUNWAY 2 2,700 SF, RUNWAY 20 3,500 SF
 - LIGHT RECONFIGURATION:
 - 8 OUTBOARD RUNWAY THRESHOLD LIGHTS - RELOCATE EXISTING RUNWAY THRESHOLD LIGHTS PER DETAIL 2, THIS SHEET
 - YELLOW/CLEAR LENSES/GLOBES - CONTRACTOR SHALL RELOCATE EXISTING YELLOW/CLEAR LENSES/GLOBES FOR RUNWAY EDGE LIGHTS SO THAT THE FIRST 2000' OF RUNWAY FROM DISPLACED THRESHOLD HAS RUNWAY EDGE LIGHTS WITH YELLOW/CLEAR LENSES/GLOBE.
 - CONNECTORS AND WIRE FOR SPLICES
 - LIGHT MOUNTING MATERIALS. SEE DETAIL 2.
 - AT LEAST 150' OF RIGID CONDUIT TO PROTECT JUMPER WIRE.
 - EXISTING RUNWAY NUMBERS (18) AND MARKINGS ON RUNWAY 18 MUST BE OBLITERATED AS SHOWN BEFORE SCHEDULE I AND II, PHASE 1 CAN BEGIN.
 - EXISTING RUNWAY NUMBERS (36) AND MARKINGS ON RUNWAY 36 MUST BE OBLITERATED AS SHOWN BEFORE SCHEDULE I, PHASE 2 CAN BEGIN.



2
G058
TEMPORARY DISPLACED THRESHOLD LIGHT MOUNTING DETAIL
N.T.S.



3
G058
TYPICAL COVERED LIGHT DETAILS
N.T.S.
DO NOT REMOVE LIGHT BULBS FROM FIXTURES.



4
G058
DISPLACED THRESHOLD WIRING DIAGRAM
N.T.S.

GLOBE LEGEND	
B	BLUE/OPAQUE
Y	YELLOW/AMBER
G	GREEN
R	RED
W	WHITE

ISSUED FOR BID

THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF:

BRYAN S. GREGORY PE-2006019659 01/31/21
NAME REG. NO. DATE
FOR AND ON BEHALF OF JVIATION, INC.

JVIATION®

KIRKSVILLE
REGIONAL AIRPORT
KIRKSVILLE, MISSOURI



DES: D.W.C.	ISSUE RECORD			
	NO.	BY	DATE	DESCRIPTION
DR: F.V.	1	B.S.G.	01/31/21	ISSUED FOR BID
CH: C.L.G.				
APP: B.S.G.				

RUNWAY 18/36 AND
TAXIWAY B
REHABILITATION

TEMPORARY RELOCATED
THRESHOLD DETAILS

MoDOT PROJ. NO. 20-028A-1
JVIATION PROJ. NO. 2020.IRK.01

SHEET NAME
G058
SHEET NO.
18 of 61

APPENDIX B

**CONSTRUCTION PROJECT DAILY SAFETY
INSPECTION CHECKLIST**

NOTE: This Appendix: Construction Project Daily Safety Inspection Checklist was copied from FAA Advisory Circular 150/5370-2G (dated December 13, 2017) and formatted for use with individual projects.

Airport: **Kirksville Regional Airport**
MoDOT Project No.: **20-028A-1**
Project Name: **Runway 18/36 and Taxiway B Rehabilitation**
Date: _____

Appendix 4. 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.

Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			<input type="checkbox"/>
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.			<input type="checkbox"/>
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			<input type="checkbox"/>
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			<input type="checkbox"/>
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.			<input type="checkbox"/>
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 approach zones.			<input type="checkbox"/>

Item	Action Required	or	None
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.			<input type="checkbox"/>
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.			<input type="checkbox"/>
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.			<input type="checkbox"/>
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.			<input type="checkbox"/>
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.			<input type="checkbox"/>
Obliterated or faded temporary markings on active operational areas.			<input type="checkbox"/>
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			<input type="checkbox"/>
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.			<input type="checkbox"/>
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.			<input type="checkbox"/>
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.			<input type="checkbox"/>
Lack of radio communications with construction vehicles in airport movement areas.			<input type="checkbox"/>

Item	Action Required	or	None
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.			<input type="checkbox"/>
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.			<input type="checkbox"/>
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			<input type="checkbox"/>
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			<input type="checkbox"/>
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.			<input type="checkbox"/>
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			<input type="checkbox"/>
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			<input type="checkbox"/>
Site burning, which can cause possible obscuration.			<input type="checkbox"/>
Construction work taking place outside of designated work areas and out of phase.			<input type="checkbox"/>

APPENDIX C

GEOTECHNICAL REPORT



Millennia Professional Services

6439 Plymouth, Suite W-129, St. Louis, Missouri 63133 • 314-531-3981

March 17, 2020
Project MG20012

Anthony Brusseau, Construction Manager
Jviation, Inc.
900 S. Broadway, Suite 350
Denver, Colorado 80209

**Subject Geotechnical Report
 Kirksville Regional Airport –Runway 18-36 & Taxiway B Rehabilitation
 Kirksville, Missouri**

Dear Mr. Brusseau:

Introduction

Millennia Professional Services, Ltd., (MPS) is pleased to submit this geotechnical report to Jviation, Inc. prepared for the design and construction of the proposed pavement rehabilitation for Runway 18-36 and Taxiway B at the Kirksville Regional Airport in Kirksville, Missouri. Our understanding of the project is based on information provided by Jviation, Inc. (Jviation), along with our experience on similar projects. The work was performed in general accordance with the MPS proposal for the project, dated January 15, 2020.

Purpose and Scope

The purpose of the geotechnical study will be to obtain information concerning subsurface conditions at the site to form conclusions and make engineering recommendations for the following geotechnical considerations:

- A general geologic reconnaissance of the site to observe for geotechnical conditions that might affect the design, construction, and performance of the runway.
- Parameters for use in pavement design for both asphalt and concrete that are in accordance with FAA Advisory Circular 150/5320-6F, including a California Bearing Ratio (CBR) value, and estimated modulus of subgrade reaction (k) value.
- The location and description of any potentially deleterious materials encountered at the boring locations that may interfere with construction progress or structure performance.
- The potential impact of groundwater on the design and construction of the structures.
- The potential impact of shallow bedrock on the design and construction of the structures, if encountered.
- General comments on the swell/consolidation potential of the soils at the site.
- The estimated design frost depth and frost potential of soils at the site.
- The suitability of the on-site materials for use as fill and backfill, including engineering criteria for the placement of those materials.
- Provide recommendations for subgrade preparation and stabilization/modification, if applicable.

- Recommended observation, documentation and materials testing programs during construction of the structure.

Project Description

Based on a preliminary plan and project information provided by Jviation, MPS understands that the project will include full depth reclamation and spall repairs of portions of Runway 18-36, as well as the relocation of Taxiway B, at the Kirksville Regional Airport. We understand that fills for the new taxiway will not exceed four feet. There is a possibility that aircraft with gross weights in excess of 60,000 pounds will land at the airport.

Exploration

Four borings, designated as Borings B-1 through -4, were drilled at the planned location of the new Taxiway B on February 27, 2020. The borings were drilled to depths of 10 feet each. Split-spoon and Shelby tube samples were recovered at alternating boring locations at 2.5-foot sampling intervals. The borings were drilled using hollow stem auger methods. MPS also collected a composite bulk sample from the borings in the upper 5 feet of the soil profile in order to perform CBR and Proctor testing.

The approximate location of each boring is shown on the Boring Location Plan in Appendix A.

Sampling

Split-spoon and Shelby tube samples were recovered from the borings at this site. Split-spoon samples were recovered using a 2-inch outside diameter, split-barrel sampler in accordance with ASTM D 1586. Shelby tube samples were recovered using a 3-inch outside diameter, thin-walled tube sampler in accordance with ASTM D 1587. The bulk sample recovered from the borings was placed in 5-gallon buckets, with a portion placed in a glass jar for a natural moisture content determination. The sampling sequence for each boring is summarized on the Boring Log in Appendix B of this report.

Field Tests/Measurements

The following field tests and measurements were performed, unless otherwise noted, during the course of the subsurface exploration:

1. The boring locations were marked in the field by MPS by measuring from site features, as well as a site plan provided by Jviation.
2. Standard penetration tests were performed and resistances recorded during the recovery of each split-barrel sample.
3. Sample recovery measurements were made and recorded for each sampling attempt.
4. A field classification by color and texture was made for each recovered sample.
5. Observations for the presence of groundwater were made during drilling.

Laboratory Testing

A program of laboratory testing will be performed on the samples collected at the site, including visual classification, natural moisture content, dry unit weight, Atterberg limits, unconfined compressive strength, California Bearing Ratio (CBR), and modified Proctor testing.

Data

The results of the field tests and measurements were recorded on field logs and appropriate data sheets in the field. These data sheets and logs contain information concerning the drilling methods, samples attempted and recovered, indications of the presence of various subsurface materials, and the observation of groundwater. The field logs and data sheets contain the engineer's interpretations of the conditions between samples, based on the performance of the equipment and cuttings brought to the surface by the drilling tools.

Data and observations from laboratory tests were recorded on laboratory data sheets during the course of the testing program. The results of the laboratory tests are summarized in the Boring Logs in Appendix B of this report.

The Boring Logs represent considered interpretation of the field and laboratory data. The analyses and conclusions contained in this report are based on field and laboratory test results and on the interpretations of the subsurface conditions as reported in the Boring Logs. Only data pertinent to the objectives of this report have been included on these Logs; therefore, these records should not be used for other purposes.

Generalized Subsurface Profile

The generalized subsurface profile beneath the pavement section includes lean, lean to fat, and fat clays (CL, CL-CH, and CH, as designated by the Unified Soil Classification System). The soils encountered at the site contain a variable content of sand. The materials encountered generally varies from soft to very stiff, based on standard penetration test (N) values ranging from 4 to 20 blows per foot (bpf) and unconfined compressive strengths estimated from pocket penetrometer values ranging from 0.75 to 4.5 tons per square foot (tsf). Moisture contents range from 17 to 29 percent. Shelby tube samples obtained in the soil yielded unconfined compressive strength values of 0.93 and 2.04 tsf, with corresponding dry unit weight values of 97 and 100 pounds per cubic feet (pcf). Atterberg limits testing on select samples of the soil yielded liquid limit values that range from 52 to 60 percent and plasticity indices that range from 34 to 41 percent.

Groundwater

Groundwater was not observed during drilling or at completion at any of the sampled locations. Groundwater information at each boring location is reported on the Boring Logs. The groundwater level may fluctuate due to seasonal variations, and other considerations that may not have been evident at the time the measurements were made.

Geotechnical Recommendations

Pavement Design Considerations

Modified Proctor compaction tests and California Bearing Ratio (CBR) tests were performed on a bulk sample taken from a composite of all borings recovered from the site within a depth range of 0.5 to 4.0 feet below the existing ground surface. The tests were performed using samples obtained from the bulk sample location with the assumption that the recovered materials were representative of the material beneath the proposed pavement. Two sets of test were performed, one sample left untreated, and the other treated with the addition of 4% quicklime. MPS collected a sample of quicklime from Lhoist North America's facility in Ste. Genevieve, Missouri, which was used during the soil subgrade modification process for a previous construction project at the airport. The results of the Proctor and CBR results are summarized in the following table:

Summary of Proctor and CBR Testing

Bulk Sample I.D.	Sample Depth (ft.)	Sample Treatment	USCS Classification	Optimum Moisture Content (%)	Maximum Dry Density (pcf)	Dry Density at 90% Compaction (pcf)	CBR Value
LSN-3374	0.5-4.0	Untreated	CH	14.7	114.3	100.8	1.0
LSN-3374	0.5-4.0	4% Quicklime	CH	13.7	111.6	103.6	34.1

The results of the laboratory testing on the untreated composite sample indicate the soils are high plasticity, with a natural moisture content of approximately 25 percent (10 percent above the optimum moisture content), and a swell potential of about 9 percent. MPS recommends that the soil subgrade be modified with quicklime or "Code L" to a minimum depth of 12 inches. Based on the general character of the soils encountered at the borings, as well as the results of the laboratory testing, a California Bearing Ratio (CBR) value of 30 is considered appropriate for design of new asphaltic concrete pavements, if the subgrade soils are modified with quicklime. Assuming the subgrade soils will be modified with quicklime, a modulus-of-subgrade reaction value of 400 pounds per cubic inch can be used for the design of Portland cement concrete pavements. MPS should be consulted if alternative methods of soil subgrade stabilization are considered, since the pavement design parameters may differ depending on the stabilization method used. These values are based on the assumption that the subgrade is prepared in accordance with the recommendations provided in this geotechnical report.

Frost Considerations

The soil subgrade at the site generally consists of lean and fat (high plasticity) clays. Based on the results of Atterberg limits tests performed on the soil samples, the plasticity index (PI) appears to be above 12. The onsite soils correspond to a FAA frost group classification of FG-3, indicating medium frost susceptibility. The design frost depth in the general area of the airport is considered to be approximately 36 inches.

Swelling Soil Considerations

As previously discussed, relatively high plasticity (fat) clays were encountered at several of the boring locations. Some fat clay soil tends to swell when water is absorbed and shrink as the material dries. Potential detrimental effects include heaving, settlement, and differential movements of foundations, floor slabs, and pavements. The planned lime stabilization is expected to significantly reduce the potential for swell.

However, some additional, relatively simple design and construction considerations are recommended that will aid in maintaining the natural moisture content of the clay, and reducing the potential for swell. Avoiding conditions that could result in excessive wetting or drying of the subgrade will reduce the potential for volume instability. The following design and construction precautions are recommended:

1. Positive surface drainage should be provided during and after construction to prevent ponding of water on or adjacent to airport pavements.
2. Stormwater runoff from any building roofs near airport pavements should be collected by a gutter system, or other means, and carried away from the airport pavements to avoid saturating the subgrade under and adjacent to the pavements.
3. Deep-rooted trees or shrubs planted for landscaping purposes should be kept a distance of one mature height away from the pavements to prevent their roots from withdrawing excessive moisture from the underlying clay soils.
4. Excessive watering of grass or shrubs adjacent to the pavements should be avoided.
5. If used as fill material, high plasticity, fat clay should be placed and compacted at or above the optimum moisture content of the soil, and subgrades consisting of high plasticity clay should not be allowed to dry below the optimum moisture content during construction. It is considered critical that the subgrade be rewetted and reconditioned prior to the placement of pavements if these areas become dry after prolonged exposure.

Construction Considerations

Subgrade Preparation

The construction areas should be stripped of vegetation and organic soil prior to site excavation and grading. After the removal of these materials, and where further excavation is not planned, the exposed subgrade should be proofrolled. Proofrolling is accomplished by passing over the subgrade with proper compaction equipment and observing the subgrade for pockets of excessively soft, wet, disturbed, or otherwise unsuitable soils. Any unacceptable materials thus found should be excavated and either recompacted or replaced with new fill.

Generally, prior to placing fill, pavement materials, or structural elements in any area, the subgrade should be scarified to a depth of about 6 inches, the moisture content of the soil adjusted to near its optimum moisture content, and the subgrade recompacted in accordance with recommendations made in subsequent sections of this report. This recommended proofrolling and recompaction of the subgrade may be waived by MPS if it is determined based on field observations that it is unnecessary or could be detrimental to the existing subgrade condition.

As previously mentioned, MPS recommends that quicklime or “Code L” be incorporated in modifying the clay subgrade. The incorporation of the lime into the fat clay will reduce the plasticity, shrink/swell potential, and increase the shear strength of the soil. As an added benefit, lime stabilization will likely increase the CBR value for the subgrade, potentially reducing the pavement design thickness. A minimum thickness of 12 inches of lime modified soil would be appropriate. The addition of 3 to 5 percent lime by dry weight is normally required when using lime. The design values presented in this report are based on a soil subgrade treatment of 4 percent lime by dry weight. Caution should be used when applying lime, and local authorities should be contacted for permission to use lime, for it is a fine-grained and somewhat caustic material that is easily windborne.

Fill Material

Any required site grading fill and backfill may be constructed using the natural materials available from on-site excavations. Fill material from off-site borrow sources may also be used, but should be approved by MPS prior to placement. In general, new fill should consist of low plasticity lean clays or clayey silts with a liquid limit of less than 50 and a plasticity index of less than 25.

At the time of construction, the moisture content of the fill materials may be variable, and may not be within the range considered necessary for proper placement and compaction. Prior to compaction, some of the soil may require moisture content adjustment. During warm weather, moisture reduction can generally be accomplished by disking, or otherwise aerating, the soil. When air-drying is not feasible, a moisture-reducing chemical additive, such as quicklime or “Code L” lime dust, could be incorporated into the cohesive soil. Lime dust is a caustic material that should be used with caution by a contractor experienced with its application. MPS should be consulted to assess the effectiveness of any additive and to recommend the amount and methods for application.

If earthwork is performed during a period of dry weather, some of the fill may require the addition of moisture prior to compaction. This should be performed in a controlled manner using a tank truck with a spray bar, and the moistened soil should be thoroughly blended with a disk

or pulverizer to produce a uniform moisture content. Repeated passages of the equipment may be required to achieve a reasonably uniform moisture content.

If this project is constructed during the winter season, fill materials should be carefully observed to see that no ice or frozen soils are placed as fill or remain in the base materials upon which fill is placed.

Fill Placement

Fill for general site grading should be placed in layers not exceeding eight inches in loose thickness and compacted to the required dry density. Backfill compacted by handheld equipment should be placed in layers not greater than six inches. The layer thickness may be increased if tests indicate that compaction could be achieved uniformly throughout the layer using a greater thickness.

At the time of compaction, lean clay fill should generally be within 3 percent, wet or dry, of the optimum moisture content of the material as determined by the modified Proctor compaction test, ASTM D 1557. Fat clay fill should be placed within zero to 4 percent wet of optimum. Fill consisting of soil should be compacted to a dry density of not less than 90 percent of the modified Proctor maximum dry density of the material. Fill consisting of well-graded crushed limestone should be compacted to a dry density of not less than 95 percent of the modified Proctor maximum dry density of the material. Because of the variability in the composition of the existing fill, it may be difficult to develop a representative Proctor curve, and testing for compliance with compacted density specifications could be challenging.

Subgrade Protection

Construction areas should be properly drained in order to reduce or prevent surface runoff from collecting on the subgrade. Any ponded water on the exposed subgrade should be removed immediately. To prevent unnecessary disturbance of the subgrade soils, trucks and other heavy construction vehicles should be restricted from traveling through the finished subgrade area. If disturbed areas develop, they should be reworked and compacted as previously described.

Construction Phase Services

It is recommended that MPS review the plans and specifications for the project prior to bid solicitation in order to determine the relationship of the geotechnical information presented in this report with the final design of the facility. This additional service is recommended in order to reduce construction phase problems that might otherwise arise in the field and result in construction delays or change orders.

Documenting observations and performing materials testing during construction of foundations, retaining walls, pavements, and other structures that are supported by earth materials is an integral aspect of the geotechnical engineering process. The geotechnical engineering profession is based on the "Observational Method," through which design assumptions and recommendations, based on limited drilling and sampling data, can be verified or modified in response to actual conditions observed as the materials are exposed by construction equipment.

Selecting the same firm that provided the geotechnical engineering services to also perform observation and materials testing services during construction results in decreased risk to the owner and entire design team. The geotechnical firm is most familiar with the site and can recognize unanticipated conditions that might otherwise adversely affect construction progress or structure performance. MPS has a staff of experienced field technicians and a geotechnical and materials testing laboratory equipped to support a wide variety of construction projects. After the project plans and specifications have been prepared, MPS requests the opportunity to submit a proposal to perform the specified construction observation and materials testing services.

For this project, it is recommended that MPS be retained by Aviation or the owner during construction to perform the following observations and field tests, where applicable:

1. Observation and documentation of asphalt placement, along with compaction testing for conformance with the project specifications.
2. Quality assurance testing associated with asphalt associated with FAA regulations.
3. Quality assurance testing of fresh concrete delivered to the site and compressive strength testing of concrete cylinders cast on site for conformance with the project specifications.
4. Observation and documentation of topsoil stripping and the removal and replacement of any deleterious materials encountered.
5. Observation and documentation of fill and backfill placement, along with compaction testing for conformance with the project specifications.

These quality assurance services should help to verify design assumptions and to maintain construction procedures in accordance with the contract plans, specifications, and good construction/engineering practice.

Closing

This report has been prepared for Jviation, Inc. for use in the design and construction of the proposed pavement rehabilitation for Runway 18-36 and Taxiway B at the Kirksville Regional Airport in Kirksville, Missouri. This report has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made to the professional advice and recommendations included herein. This report is not for use by parties other than those named or for purposes other than those stated herein. It may not contain sufficient information for the use of other parties or for other purposes.


If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed by MPS to determine the applicability of the analyses and recommendations considering the changed conditions and time lapse. The report should also be reviewed by MPS if changes occur in structure location, size, and type, or in the planned loads, elevations, grading plans, and project concepts.

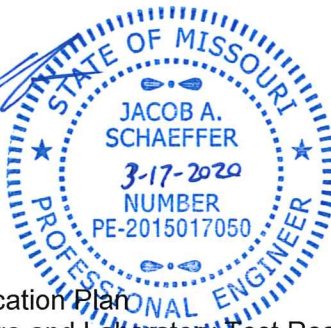
These analyses and recommendations are based on data obtained from site reconnaissance, the borings performed for this study and other pertinent information presented herein. This report does not reflect any variations between, beyond, or below the borings. Should such variations become evident, it may be necessary to re-evaluate the recommendations of this report after performing on-site observation during the construction period and noting the characteristics of any such variation.

We appreciate this opportunity to be of service to you and would be pleased to discuss any aspect of this report with you at your convenience.

Sincerely,

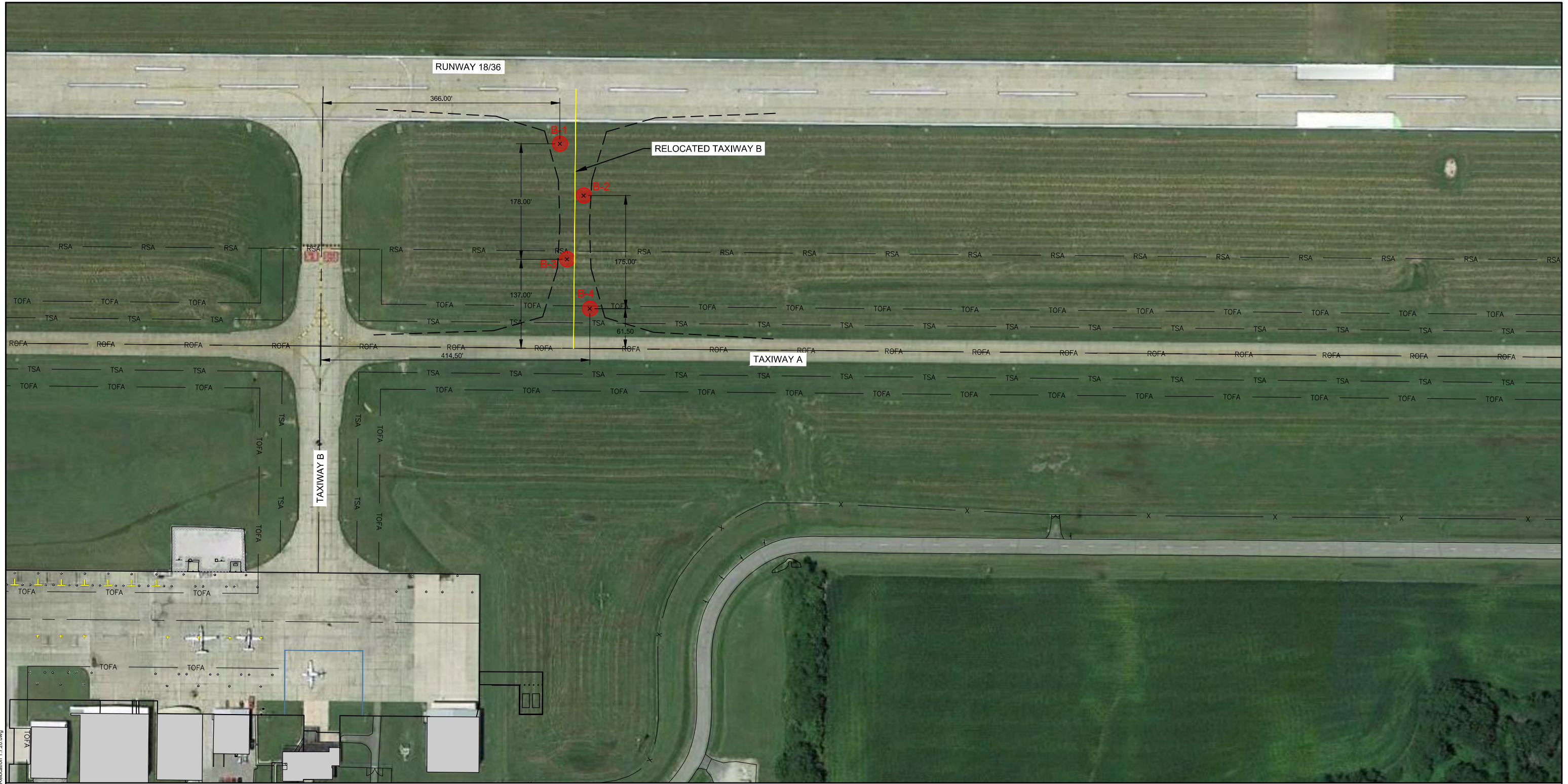
Millennia Professional Services


Jacob A. Schaeffer, P.E.
Project Manager

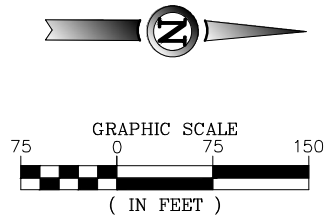


Appendices: A. Boring Location Plan
B. Boring Logs and Laboratory Test Results

Appendix A:
Figure 1: Boring Location Plan



Plotted February 18, 2020 @ 4:34 PM by Anthony Bruseau
E:\KIRK2020\KIRK 18-36\18-36\18-36.dwg



JVIATION®

931 WILDWOOD DR • SUITE 101 • JEFFERSON CITY, MO 65109

PHONE: 573-636-3200 • FAX: 573-636-3201

• WWW.JVIATION.COM •

KIRKSVILLE REGIONAL AIRPORT
TAXIWAY B RELOCATION
GEOTECHNICAL INVESTIGATION EXHIBIT

DATE: FEBRUARY 18, 2020

SHEET 1 OF 1

Appendix B: Boring Logs and Laboratory Test Results



Millennia Professional Services of Illinois, Ltd.
11 Executive Drive Suite 12
Fairview Heights, Illinois 62208
Telephone: 618-624-8610
Fax: 618-624-8611

BORING NUMBER B-1

PAGE 1 OF 1

CLIENT	Jviation Inc.	PROJECT NAME	Kirksville Regional Airport- Taxiway B
PROJECT NUMBER	MG20012	PROJECT LOCATION	Kirksville, Missouri
DATE STARTED	2/27/20	COMPLETED	2/27/20
DRILLING CONTRACTOR	Midwest Drilling	GROUND ELEVATION	
DRILLING METHOD	Hollow Stem Auger	HOLE SIZE	inches
LOGGED BY	F. Khan	CHECKED BY	J. Schaeffer
NOTES			
GROUND WATER LEVELS:		AT TIME OF DRILLING --- - dry	
		AT END OF DRILLING --- - dry	
		AFTER DRILLING ---	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Brown, TOPSOIL (5.0")										
		Grey-brown, lean to fat CLAY (CL-CH), trace sand	SS 1	28	4-2-2 (4)			19				
		Grey-brown, fat CLAY (CH), trace sand	SS 2	67	4-5-5 (10)	2.0		25				
5			SS 3	89	3-3-3 (6)	0.75		25				
			SS 4	72	3-4-4 (8)	2.0		29				
10												

Bottom of borehole at 10.0 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 3/17/20 13:21 - G:\PROJECT FILES\2020\MG20012 KIRKSVILLE REGIONAL AIRPORT - TAXIWAY B\FIELD DATA\KIRKSVILLE REGIONAL AIRPORT- TAXIWAY B.GPJ



Millennia Professional Services of Illinois, Ltd.
11 Executive Drive Suite 12
Fairview Heights, Illinois 62208
Telephone: 618-624-8610
Fax: 618-624-8611

BORING NUMBER B-2

PAGE 1 OF 1

CLIENT Aviation Inc. **PROJECT NAME** Kirksville Regional Airport- Taxiway B
PROJECT NUMBER MG20012 **PROJECT LOCATION** Kirksville, Missouri
DATE STARTED 2/27/20 **COMPLETED** 2/27/20 **GROUND ELEVATION** _____ **HOLE SIZE** _____ inches
DRILLING CONTRACTOR Midwest Drilling **GROUND WATER LEVELS:**
DRILLING METHOD Hollow Stem auger **AT TIME OF DRILLING** --- - dry
LOGGED BY F. Khan **CHECKED BY** J. Schaeffer **AT END OF DRILLING** --- - dry
NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		TOPSOIL (5.0")										
		Brown and gray, lean to fat CLAY (CL-CH)	SS 1	67	3-4-5 (9)	>4.5		27				
		Brown and gray, fat CLAY (CH) - undrained shear strength = 2.04 tsf at 3.0 ft.	ST 2	100			100	16	52	16	36	
5			SS 3	67	4-5-5 (10)	2.5		22				
			SS 4	72	3-3-6 (9)	2.5		25				
10												

Bottom of borehole at 10.0 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 3/17/20 13:21 - G:\PROJECT FILES\2020\MG20012 KIRKSVILLE REGIONAL AIRPORT - TAXIWAY BIFIELD DATA\KIRKSVILLE REGIONAL AIRPORT- TAXIWAY B.GPJ



Millennia Professional Services of Illinois, Ltd.
11 Executive Drive Suite 12
Fairview Heights, Illinois 62208
Telephone: 618-624-8610
Fax: 618-624-8611

BORING NUMBER B-3

PAGE 1 OF 1

CLIENT	Jviation Inc.	PROJECT NAME	Kirksville Regional Airport- Taxiway B
PROJECT NUMBER	MG20012	PROJECT LOCATION	Kirksville, Missouri
DATE STARTED	2/27/20	COMPLETED	2/27/20
DRILLING CONTRACTOR	Midwest Drilling	GROUND ELEVATION	
DRILLING METHOD	Hollow Stem Auger	HOLE SIZE	inches
LOGGED BY	F.khan	CHECKED BY	J. Schaeffer
NOTES			
GROUND WATER LEVELS:		AT TIME OF DRILLING --- - dry	
		AT END OF DRILLING --- - dry	
		AFTER DRILLING ---	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		TOPSOIL (5.0")										
		Grey to brown, lean CLAY (CL)										
			SS 1	72	3-7-7 (14)	>4.5		18				
5			SS 2	72	6-8-12 (20)	>4.5		17				
		Grey, fat CLAY (CH)										
			SS 3	78	4-6-6 (12)	2.0		23				
10			SS 4	67	4-5-7 (12)	2.5		23				

Bottom of borehole at 10.0 feet.

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 3/17/20 13:21 - G:\PROJECT FILES\2020\MG20012 KIRKSVILLE REGIONAL AIRPORT - TAXIWAY B\FIELD DATA\KIRKSVILLE REGIONAL AIRPORT - TAXIWAY B.GPJ



Millennia Professional Services of Illinois, Ltd.
11 Executive Drive Suite 12
Fairview Heights, Illinois 62208
Telephone: 618-624-8610
Fax: 618-624-8611

BORING NUMBER B-4

PAGE 1 OF 1

CLIENT	Jviation Inc.	PROJECT NAME	Kirksville Regional Airport- Taxiway B
PROJECT NUMBER	MG20012	PROJECT LOCATION	Kirksville, Missouri
DATE STARTED	2/27/20	COMPLETED	2/27/20
DRILLING CONTRACTOR	Midwest Drilling	GROUND ELEVATION	
DRILLING METHOD	Hollow Stem auger	HOLE SIZE	inches
LOGGED BY	F.khan	CHECKED BY	J. Schaeffer
NOTES			
GROUND WATER LEVELS:		AT TIME OF DRILLING --- - dry	
		AT END OF DRILLING --- - dry	
		AFTER DRILLING ---	

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 3/17/20 13:21 - G:\PROJECT FILES\2020\MG20012 KIRKSVILLE REGIONAL AIRPORT - TAXIWAY B\FIELD DATA\KIRKSVILLE REGIONAL AIRPORT- TAXIWAY B.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		TOPSOIL (5.0")										
		Grey-brown, lean to fat CLAY (CL-CH)	SS 1	67	4-5-6 (11)	2.5		23				
		Grey-brown, fat CLAY (CH)	ST 2	100			97	18	53	19	34	
5		- undrained shear strength = 0.93 tsf at 3.0 ft.										
			SS 3	100	3-4-5 (9)	1.5		23				
			SS 4	78	3-5-6 (11)	1.0		25				
10												

Bottom of borehole at 10.0 feet.

GENERAL NOTES

The number of borings is based on topographic and geologic factors: the magnitude of loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling is selected to reduce the possibility of undiscovered anomalies and increase drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as encountering water, boulders, gas, zones of lost circulation, relative ease or resistance of drilling progress, unusual sample recovery, variation in driving resistance, unusual odors, etc. However, lack of mention of such variations does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Boring Logs may not have stabilized, particularly in more permeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to effects of precipitation, infiltration, or other factors not evident at the times indicated.

Unless otherwise noted, soil classifications indicated on the Boring Logs are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness will be described as seams while thicker strata will be logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Boring Logs are approximate boundaries only as the actual material change may be between samples or may be a gradual transition.

Samples chosen for laboratory testing are selected in such a manner so as to determine selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and only representative samples are tested, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

Moisture Content (%) 16.3

Undrained Shear Strength, τ (tsf) 2.04

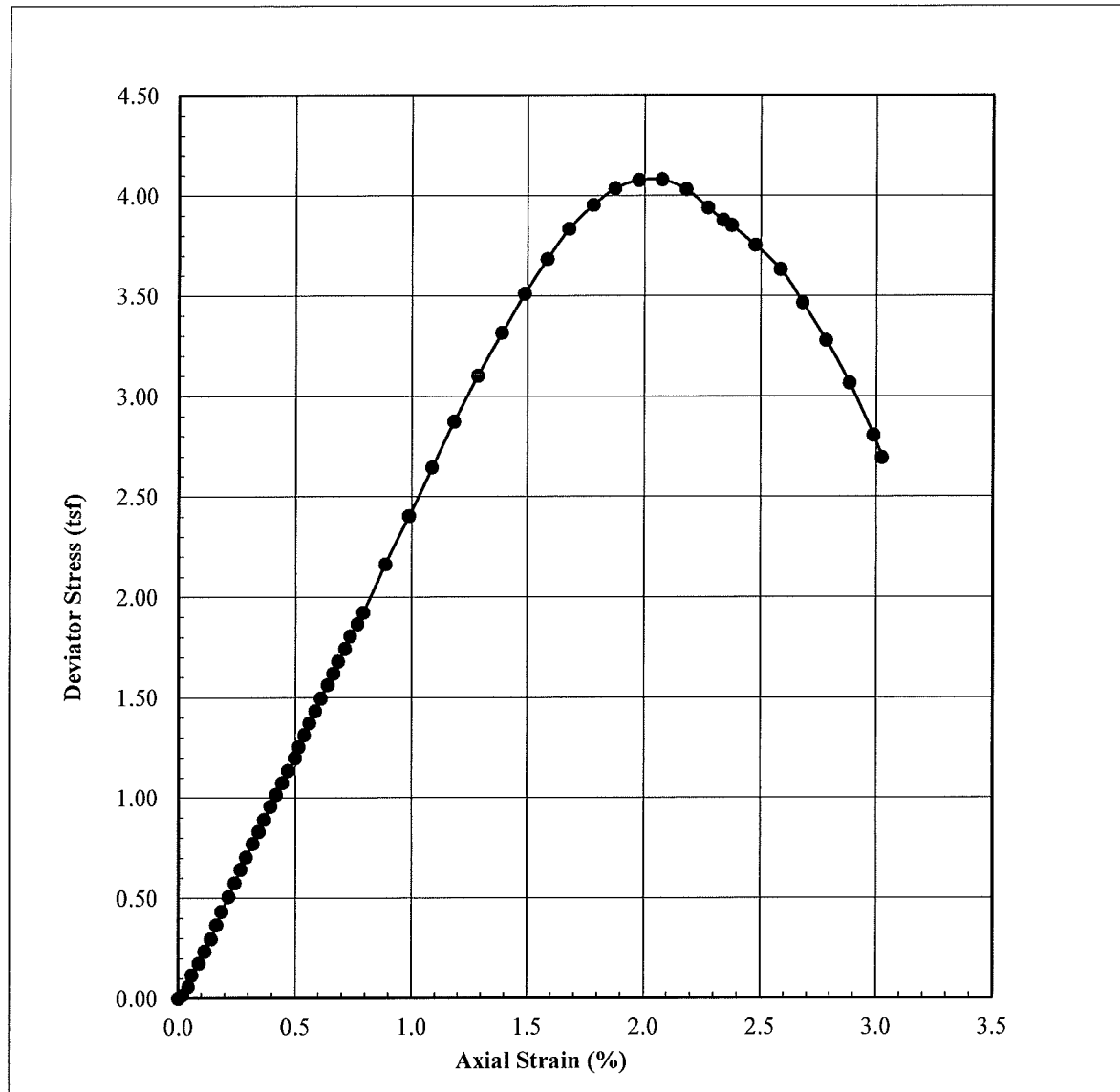
Wet Density (pcf) 116.1

Compressive Strength q_u, σ (tsf) 4.08

Initial Dry Density (pcf) 99.9

Failure Strain (%) 2.1

Remarks



UNCONFINED COMPRESSION TEST

ASTM D 2166

Project No.: J022300.04.6425

Boring: B-2

Sample: ST-2 - Depth: 3.0-5.0 ft.

Moisture Content (%) 17.9

Undrained Shear Strength, τ (tsf) 0.93

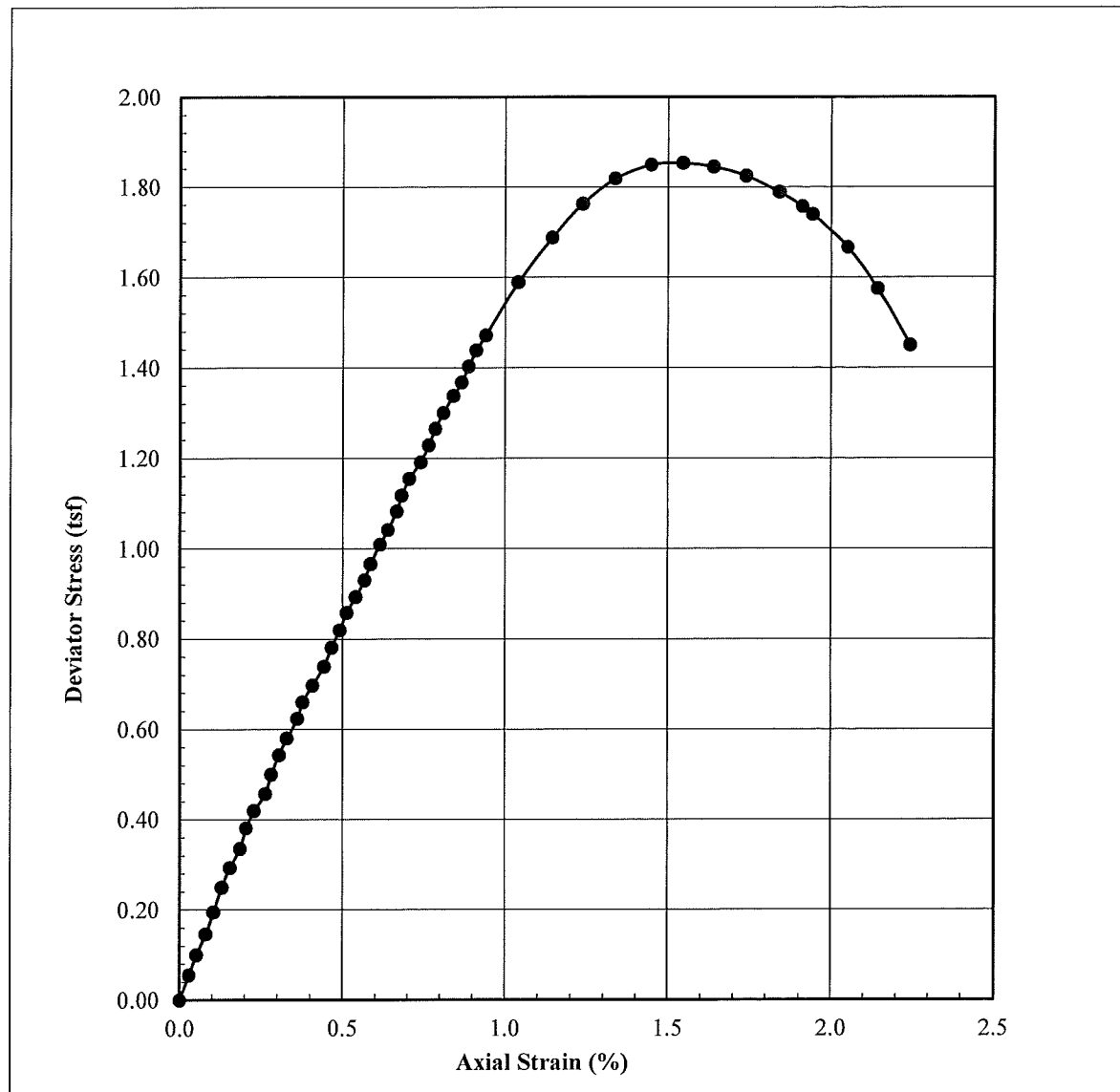
Wet Density (pcf) 114.8

Compressive Strength q_u, σ (tsf) 1.85

Initial Dry Density (pcf) 97.4

Failure Strain (%) 1.5

Remarks



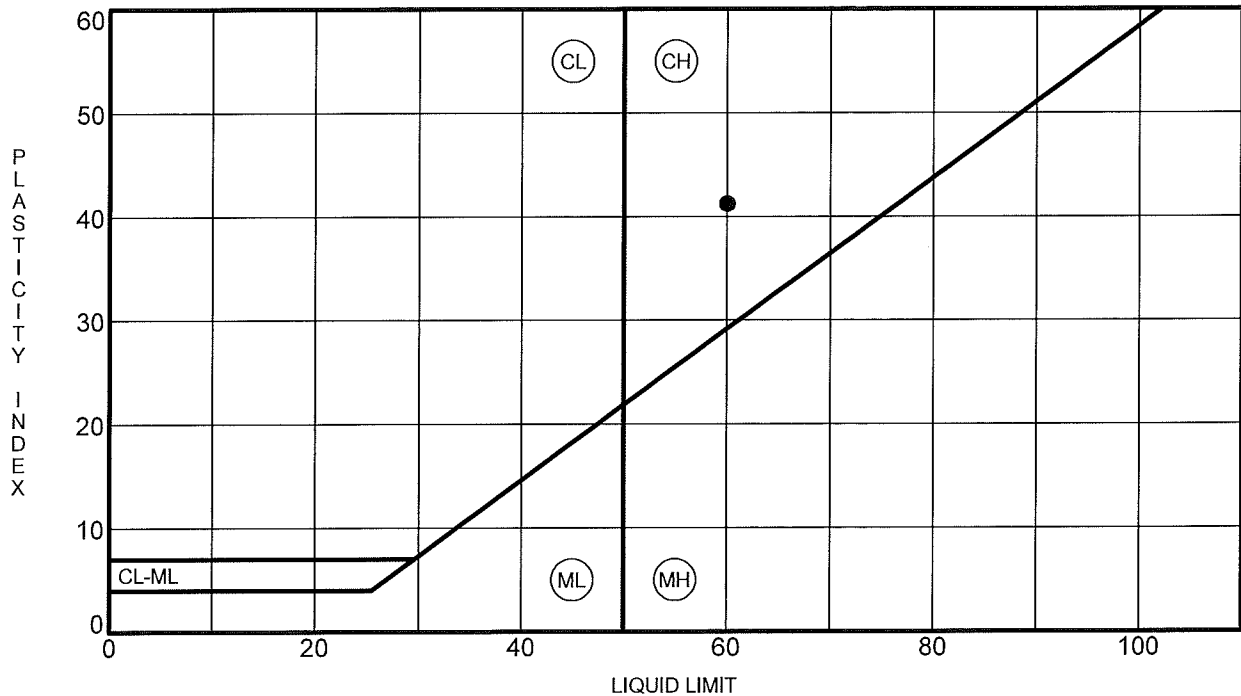
UNCONFINED COMPRESSION TEST

ASTM D 2166

Project No.: J022300.04.6425

Boring: B-4

Sample: ST-2 - Depth: 3.0-5.0 ft.

[illegible]

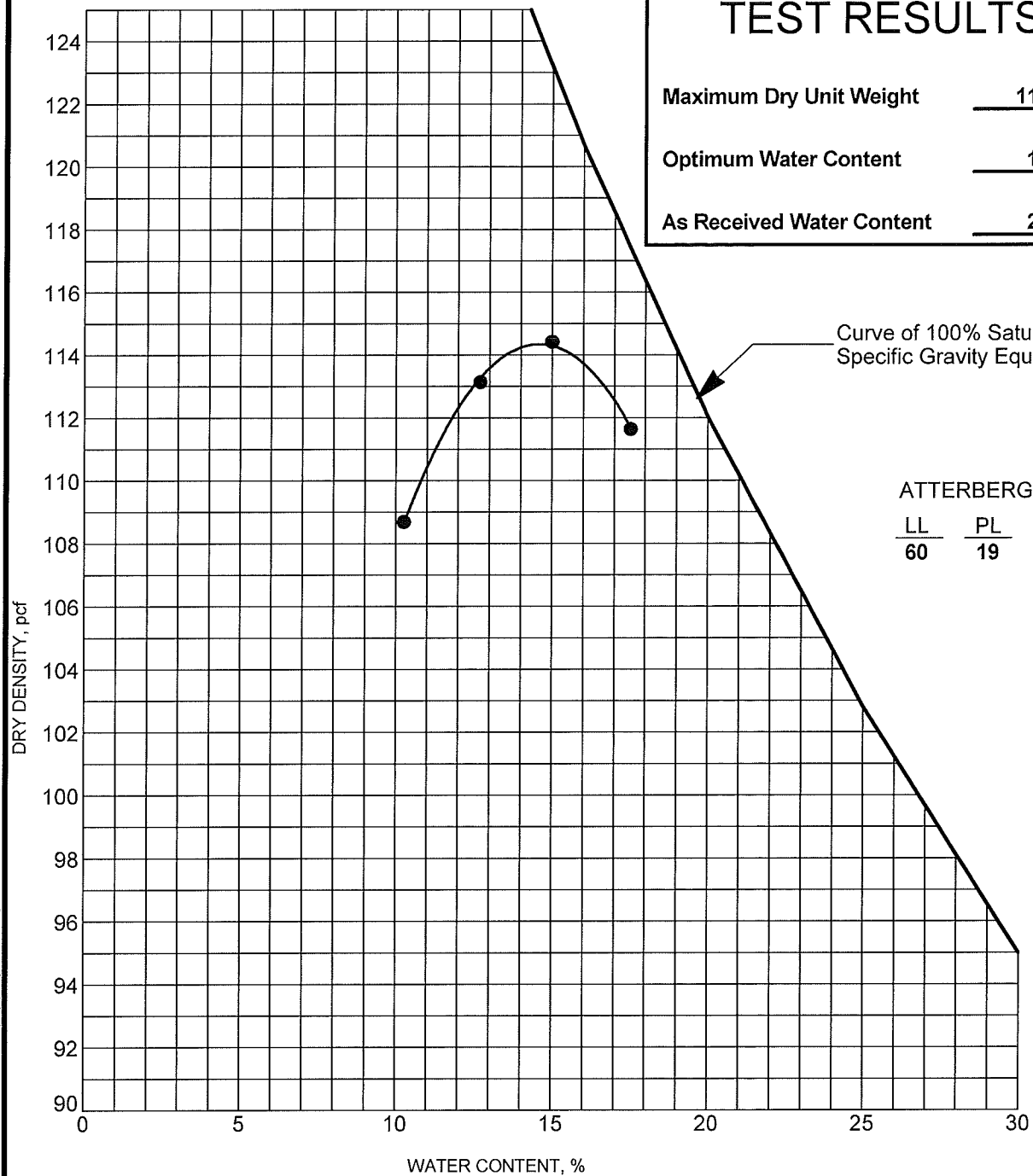
ATTERBERG LIMITS' RESULTS

Project Number: J022300.04.6425

Project: Kirksville Taxiway B

Location: Kirksville, Missouri

PROCTOR CURVE 90 TO 125 POUNDS J022300.04.6425 LAB RESULTS.GPJ GEOTECHNOLOGY.GDT 3/11/20



Sample No. LSN-3374
Depth 1.0-5.0 Feet
Test Method ASTM D1557-A (Modified)

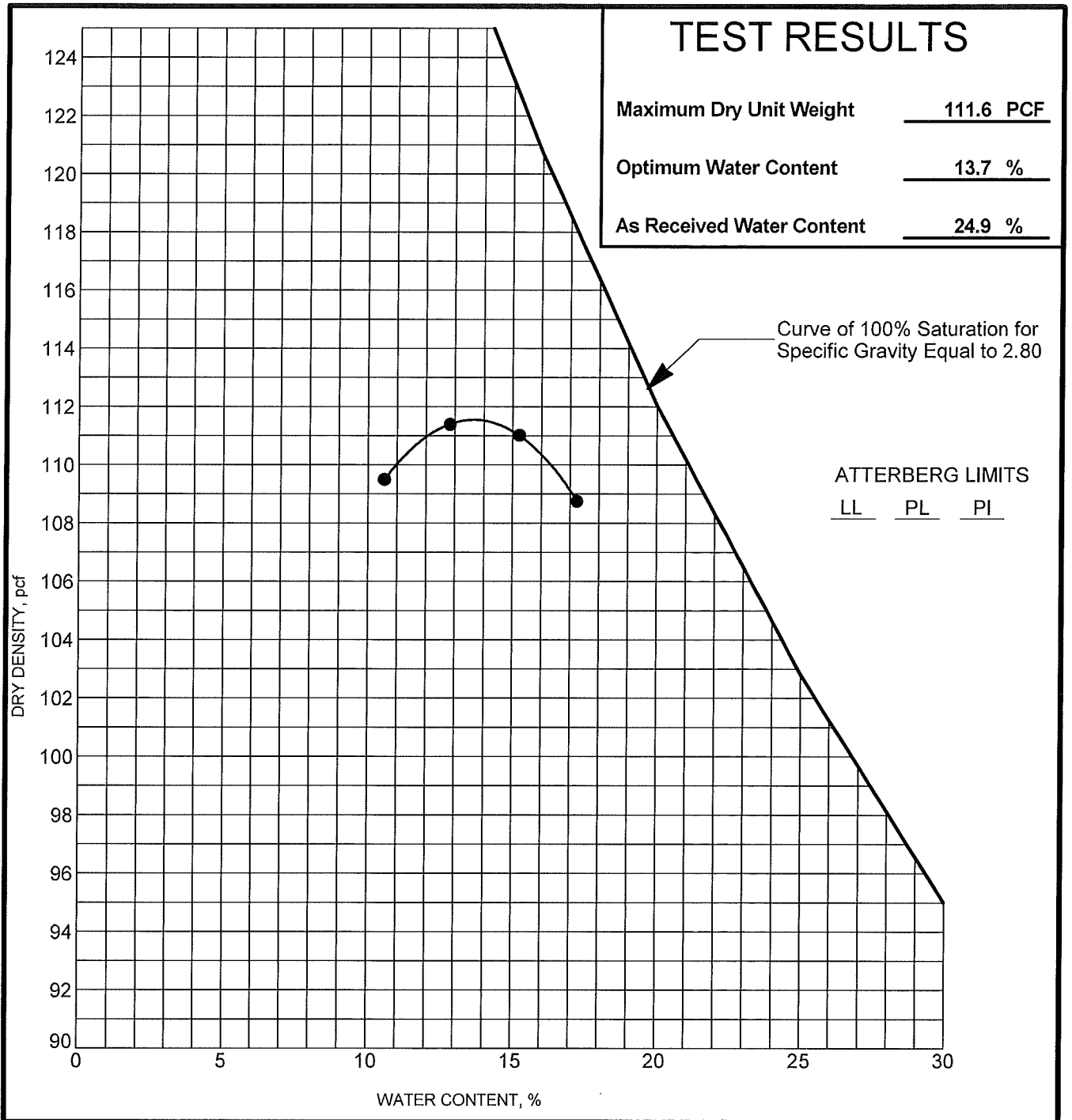
Source of Material Borings B-1 through B-4 Combined
Description of Material Gray-brown, FAT CLAY - (CH)



MOISTURE-DENSITY RELATIONSHIP

Project Number: J022300.04.6425
Project: Kirksville Taxiway B
Location: Kirksville, Missouri

PROCTOR CURVE 90 TO 125 POUNDS J022300.04.6425 LAB RESULTS.GPJ GEOTECHNOLOGY.GDT 3/1/20



Sample No. LSN-3374 +4%
Depth 1.0-5.0 Feet
Test Method ASTM D1557-A (Modified)

Source of Material Borings B-1 through B-4 Combined
Description of Material Gray-brown, FAT CLAY - (CH) +
4% Quicklime

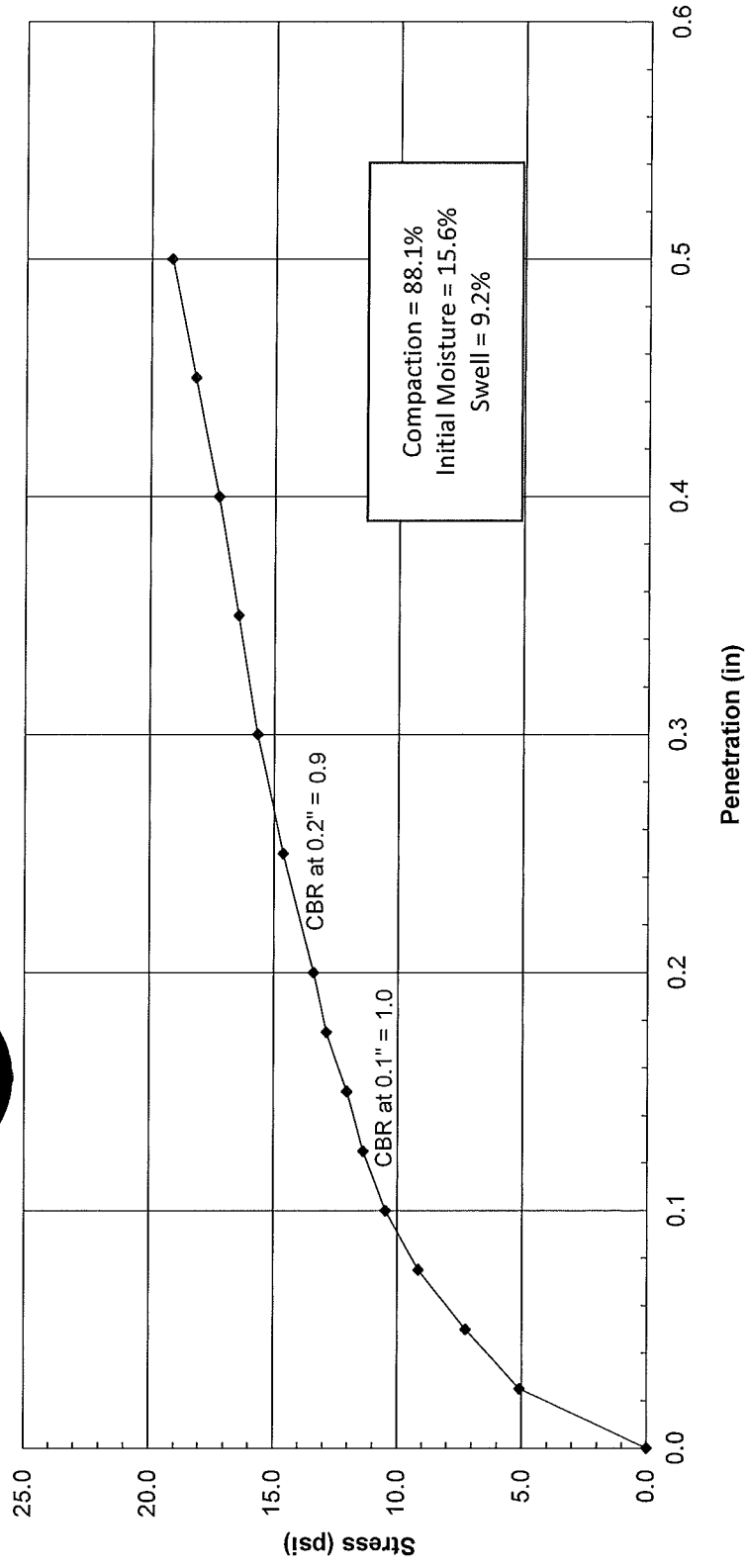


MOISTURE-DENSITY RELATIONSHIP

Project Number: J022300.04.6425
Project: Kirksville Taxiway B
Location: Kirksville, Missouri



GEOTECHNOLOGY
FROM THE GROUND UP



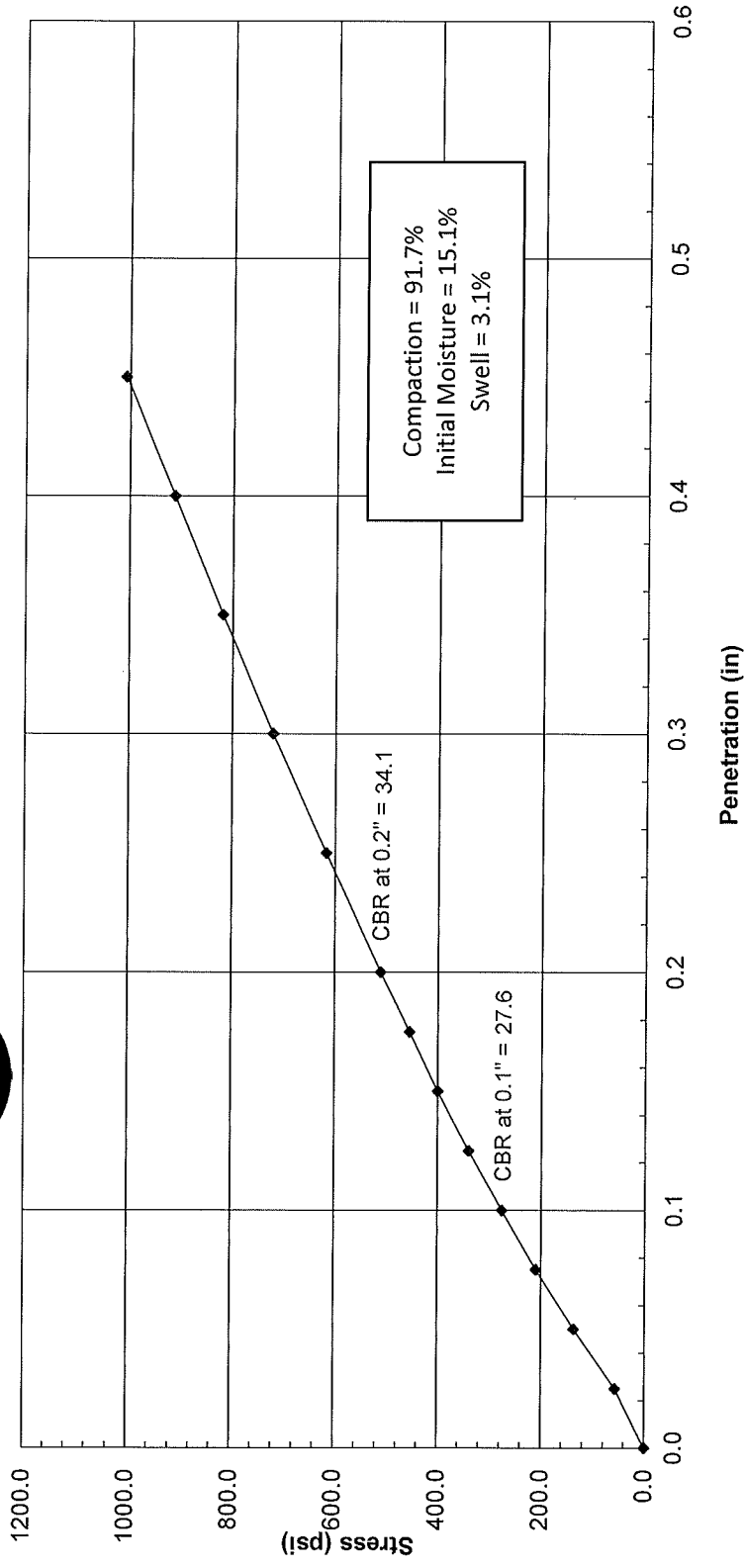
CALIFORNIA BEARING RATIO (CBR) TEST

ASTM D1883

Project No.: J022300.04.6425

Location: Kirksville Taxiway B

Material: FAT CLAY - (CH)



CALIFORNIA BEARING RATIO (CBR) TEST
ASTM D1883
Project No.: J022300.04.6425
Location: Kirksville Taxiway B
Material: FAT CLAY - (CH) + 4% Quicklime

1 **PROPOSAL FORM**

2 City of Kirksville

3 State Block Grant Project No. 20-028A-1

4
5 TO:City of Kirksville

6
7 The undersigned, in compliance with the request for bids for construction of the following Project:

8
9 Schedule I - Runway 18/36 Rehabilitation

10 Schedule II - Taxiway B Rehabilitation

11 Schedule III - Remove and Construct Mid-field Connector Taxiway B

12
13 hereby proposes to furnish all labor, permits, material, machinery, tools, supplies and equipment to faithfully
14 perform all work required for construction of the Project in accordance with the project manual, project
15 drawings and issued Addenda within the specified time of performance for the following prices:

Intentionally Left Blank

BID PROPOSAL SUMMARY

Bidder Name:

SCHEDULE I TOTAL \$ _____

SCHEDULE II TOTAL \$ _____

SCHEDULE III TOTAL \$ _____

TOTAL ALL SCHEDULES \$ _____

Bidder has examined the proposed site and is familiar with all site conditions.

Signature _____

PAGE INTENTIONALLY LEFT BLANK

SCHEDULE I						
Item No.	Description		Units	Estimated Quantity	Unit Price	Total
C-100a	Contractor Quality Control Program (CQCP)	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-102a	Temporary Erosion Control	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-105a	Mobilization	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
P-101b	Spall Repair (Complete)	at the unit price of: _____ dollars and _____ cents.	SY	4,000	\$	\$
P-101c	Crack Repair (Complete)	at the unit price of: _____ dollars and _____ cents.	LF	6,000	\$	\$
P-101d	Panel Removal and Replacement (Complete)	at the unit price of: _____ dollars and _____ cents.	SY	4,280	\$	\$
P-101e	Remove and Replace Joint Sealant (Complete)	at the unit price of: _____ dollars and _____ cents.	LF	90,000	\$	\$
P-620a	Temporary Pavement Marking	at the unit price of: _____ dollars and _____ cents.	SF	55,000	\$	\$
P-620b	Permanent Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	85,500	\$	\$
P-620c	Black Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	28,000	\$	\$
P-620d	Pavement Marking Obliteration	at the unit price of: _____ dollars and _____ cents.	SF	85,000	\$	\$

SCHEDULE I TOTAL \$ _____

PAGE INTENTIONALLY LEFT BLANK

SCHEDULE II						
Item No.	Description		Units	Estimated Quantity	Unit Price	Total
C-100a	Contractor Quality Control Program (CQCP)	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-102a	Temporary Erosion Control	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-105a	Mobilization	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
P-101b	Spall Repair (Complete)	at the unit price of: _____ dollars and _____ cents.	SF	140	\$	\$
P-101c	Crack Repair (Complete)	at the unit price of: _____ dollars and _____ cents.	LF	600	\$	\$
P-101d	Panel Removal and Replacement (Complete)	at the unit price of: _____ dollars and _____ cents.	SY	620	\$	\$
P-101e	Remove and Replace Joint Sealant (Complete)	at the unit price of: _____ dollars and _____ cents.	LF	3,400	\$	\$
P-620b	Permanent Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	210	\$	\$
P-620c	Black Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	500	\$	\$

SCHEDULE II TOTAL \$ _____

PAGE INTENTIONALLY LEFT BLANK

SCHEDULE III						
Item No.	Description		Units	Estimated Quantity	Unit Price	Total
C-100a	Contractor Quality Control Program (CQCP)	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-102a	Temporary Erosion Control	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
C-105a	Mobilization	at the unit price of: _____ dollars and _____ cents.	LS	1	\$	\$
P-101a	Full Depth Pavement Removal (Complete)	at the unit price of: _____ dollars and _____ cents.	SY	3,250	\$	\$
P-152a	Unclassified Excavation	at the unit price of: _____ dollars and _____ cents.	CY	3,200	\$	\$
P-155a	Lime-treated subgrade	at the unit price of: _____ dollars and _____ cents.	SY	3,070	\$	\$
P-155b	Hydrated Lime	at the unit price of: _____ dollars and _____ cents.	TON	180	\$	\$
P-209a	Crushed Aggregate Base Course (6-Inches)	at the unit price of: _____ dollars and _____ cents.	CY	550	\$	\$
P-209b	Stabilization Fabric	at the unit price of: _____ dollars and _____ cents.	SY	3,070	\$	\$
P-501a	Portland Cement Concrete Pavement	at the unit price of: _____ dollars and _____ cents.	SY	3,070	\$	\$
P-620a	Temporary Pavement Marking	at the unit price of: _____ dollars and _____ cents.	SF	1,000	\$	\$
P-620b	Permanent Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	1,000	\$	\$
P-620c	Black Pavement Markings	at the unit price of: _____ dollars and _____ cents.	SF	1,850	\$	\$
P-620d	Pavement Marking Obliteration	at the unit price of: _____ dollars and _____ cents.	SF	300	\$	\$
P-620e	Thermoplastic Hold Position Signs	at the unit price of: _____ dollars and _____ cents.	EA	2	\$	\$
T-901a	Seeding with Hydromulch	at the unit price of: _____ dollars and _____ cents.	AC	2	\$	\$
L-108a	Install #8 AWG, L-824C, 5000V, Wire	at the unit price of: _____ dollars and _____ cents.	LF	4,930	\$	\$
L-108b	Install #6 AWG, Bare Copper Counterpoise Including Ground Rods and Terminations	at the unit price of: _____ dollars and _____ cents.	LF	3,210	\$	\$
L-110a	Install 1-2" SCH. 40 PVC Duct, Direct Earth Buried	at the unit price of: _____ dollars and _____ cents.	LF	2,950	\$	\$
L-110b	Install 1-2" SCH. 40 PVC Duct, Concrete Encased	at the unit price of: _____ dollars and _____ cents.	LF	190	\$	\$

Schedule III

SCHEDULE III						
Item No.	Description		Units	Estimated Quantity	Unit Price	Total
L-110c	Install 4-2" SCH. 40 PVC Duct, Concrete Encased	at the unit price of: _____ dollars and _____ cents.	LF	70	\$	\$
L-115a	Remove L-867B Junction Box, Complete	at the unit price of: _____ dollars and _____ cents.	EA	3	\$	\$
L-115b	Install L-867B Junction Box, Complete	at the unit price of: _____ dollars and _____ cents.	EA	2	\$	\$
L-125a	Remove Taxiway Edge Light, Complete	at the unit price of: _____ dollars and _____ cents.	EA	24	\$	\$
L-125b	Remove Runway In-Pavement Light, Complete	at the unit price of: _____ dollars and _____ cents.	EA	1	\$	\$
L-125c	Install L-862 Runway Edge Light, Base Mounted, White/White Lens, Complete	at the unit price of: _____ dollars and _____ cents.	EA	1	\$	\$
L-125d	Reinstall L-861T LED Taxiway Edge Light	at the unit price of: _____ dollars and _____ cents.	EA	24	\$	\$
L-125e	Install L-861T LED Taxiway Edge Light	at the unit price of: _____ dollars and _____ cents.	EA	17	\$	\$
L-125f	Remove L-858 Guidance Sign, Complete	at the unit price of: _____ dollars and _____ cents.	EA	4	\$	\$
L-125g	Reinstall 1 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Four New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	2	\$	\$
L-125h	Reinstall 2 Module L-858 Guidance Sign on New Concrete Pad with New Additional Module and Six New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	1	\$	\$
L-125i	Reinstall 3 Module L-858 Guidance Sign on New Concrete Pad with Six New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	1	\$	\$
L-125j	Extend Existing 1 Module L-858 Guidance Sign Base to 2 Module Base and Install 4 New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	4	\$	\$
L-125k	Extend Existing 2 Module L-858 Guidance Sign Base to 3 Module Base and Install 6 New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	1	\$	\$
L-125l	Remove Existing Panels from 2 Module L-858 Guidance Sign and Install 4 New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	2	\$	\$
L-125m	Remove Existing Panels from 3 Module L-858 Guidance Sign and Install 6 New Panels, Complete	at the unit price of: _____ dollars and _____ cents.	EA	3	\$	\$

Schedule III

SCHEDULE III					
Item No.	Description	Units	Estimated Quantity	Unit Price	Total
SCHEDULE III TOTAL \$ _____					

PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGEMENTS BY BIDDER

- a. By submittal of a proposal, the BIDDER acknowledges and accepts that the quantities established by the OWNER are an approximate estimate of the quantities required to fully complete the Project and that the estimated quantities are principally intended to serve as a basis for evaluation of bids. The BIDDER further acknowledges and accepts that payment under this contract will be made only for actual quantities and that quantities will vary in accordance with the General Provisions subsection entitled "Alteration of Work and Quantities".
- b. The BIDDER acknowledges and accepts that the Bid Documents are comprised of the documents identified within the General Provisions. The BIDDER further acknowledges that each the individual documents that comprise the Bid Documents are complementary to one another and together establishes the complete terms, conditions and obligations of the successful BIDDER.
- c. As evidence of good faith in submitting this proposal, the undersigned encloses a bid guaranty in the form of a certified check, cashier's check or bid bond in the amount of 5% of the bid price. The BIDDER acknowledges and accepts that refusal or failure to accept award and execute a contract within the terms and conditions established herein will result in forfeiture of the bid guaranty to the owner as a liquidated damage.
- d. The BIDDER acknowledges and accepts the OWNER'S right to reject any or all bids.
- e. The BIDDER acknowledges and accepts the OWNER'S right to hold all Proposals for purposes of review and evaluation and not issue a notice-of-award for a period not to exceed 90 calendar days from the stated date for receipt of bids.
- f. The undersigned agrees that upon written notice of award of contract, he or she will execute the contract within thirty (30) days of the notice-of-award, and furthermore, and provide executed payment and performance bonds within ~~thirty (30)~~ days from the date of contract execution. The undersigned accepts that failure to execute the contract and provide the required bonds within the stated timeframe shall result in forfeiture of the bid guaranty to the owner as a liquidated damage.
- g. Time of Performance: By submittal of this proposal, the undersigned acknowledges and agrees to commence work within ten (10) calendar days of the date specified in the written "Notice-to-Proceed" as issued by the OWNER. The undersigned further agrees to complete the Project within 110 Calendar days from the commencement date specified in the Notice-to-Proceed.
- h. The undersigned acknowledges and accepts that for each and every Calendar day the project remains incomplete beyond the contract time of performance, the Contractor shall pay the non-penal amount of \$750 per Calendar day as a liquidated damage to the OWNER.
- i. The undersigned prime contractor, if not a MoDOT certified DBE, hereby assures that they will subcontract 3 percent of the dollar value of the prime contract to DBE firms or make good faith efforts to meet the DBE contract goal. In addition, the prime contractor will include the DBE clauses (see Supplementary Provision No. 6 of the Federal and State Provisions) required by the DBE Program adopted by MoDOT and the city in all contracts and subcontracts relating to this project. The undersigned will complete the DBE Participation information included herein, when a DBE goal has been established, including a demonstration of good faith efforts if the DBE goal is not met. If the undersigned prime contractor is a MoDOT certified DBE firm, then the prime contractor must perform at least thirty percent (30%) of the total contract value work with its own forces, and will receive DBE credit for all work which the prime contractor and any other MoDOT certified DBE firm performs directly.

- j. The BIDDER, by submission of a proposal, acknowledges that award of this contract is subject to the provisions of the David Bacon Act and the Missouri Prevailing Wage Law. The BIDDER accepts the requirement to pay prevailing wages for each classification and type of worker as established in the attached wage rate determinations as issued by the United States Department of Labor and the Missouri Division of Labor Standards. The BIDDER further acknowledges and accepts their requirement to incorporate the provision to pay the established prevailing wages in every subcontract agreement entered into by the Bidder under this project. The highest rate between the two (Federal and State) for each job classification shall be considered the prevailing wage.
- k. Compliance Reports (41 CFR Part 60-1.7): Within 30 days after award of this contract, the Contractor/Subcontractor shall file a compliance report (Standard Form 100) if s/he has not submitted a complete compliance report within 12 months preceding the date of award. This report is required if the Contractor/Subcontractor meets all of the following conditions:
- a. Contractors/Subcontractors are not exempt based on 41 CFR 60-1.5.
 - b. Has 50 or more employees.
 - c. Is a prime contractor or first tier subcontractor.
 - d. There is a contract, subcontract, or purchase order amounting to \$50,000 or more
- l. The undersigned acknowledges receipt of the following addenda:

Addendum No. _____, dated _____	Date Received _____
Addendum No. _____, dated _____	Date Received _____
Addendum No. _____, dated _____	Date Received _____
Addendum No. _____, dated _____	Date Received _____
Addendum No. _____, dated _____	Date Received _____

REPRESENTATIONS BY BIDDER

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

- a. The BIDDER has read and thoroughly examined the bid documents including all authorized addenda.
- b. The BIDDER has a complete understanding of the terms and conditions required for the satisfactory performance of project work.
- c. The BIDDER has fully informed themselves of the project site, the project site conditions and the surrounding area.
- d. The BIDDER has familiarized themselves of the requirements of working on an operating airport and understands the conditions that may in any manner affect cost, progress or performance of the work
- e. The BIDDER has correlated their observations with that of the project documents.
- f. The BIDDER has found no errors, conflicts, ambiguities or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.
- g. The BIDDER is familiar with all applicable Federal, State and local laws, rules and regulations pertaining to execution of the contract and the project work.
- h. The BIDDER has complied with all requirements of these instructions and the associated project documents.

CERTIFICATIONS BY BIDDER

- a. The undersigned hereby declares and certifies that the only parties interested in this proposal are named herein and that this proposal is made without collusion with any other person, firm or corporation.

The undersigned further certifies that no member, officer or agent of OWNER'S has direct or indirect financial interest in this proposal.

- b. Prohibition of Non-Segregated Facilities** (41 CFR Part 60-1.8) The BIDDER agrees that it does not maintain or provide, for its employees, any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The BIDDER agrees that a breach of this clause is a violation of the Equal Opportunity Clause in this contract.

"Segregated facilities" as used in this clause, means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

The Bidder shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

- c. Trade Restriction Certification** (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--

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

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

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

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

- 1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR or
- 2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or

- 171 3) who incorporates in the public works project any product of a foreign country on such USTR
172 list.
173

174 Nothing contained in the foregoing shall be construed to require establishment of a system of records
175 in order to render, in good faith, the certification required by this provision. The knowledge and
176 information of a contractor is not required to exceed that which is normally possessed by a prudent
177 person in the ordinary course of business dealings.
178

179 The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this
180 provision for certification without modification in all lower tier subcontracts. The Contractor may rely
181 on the certification of a prospective subcontractor that it is not a firm from a foreign county included
182 on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror
183 has knowledge that the certification is erroneous.
184

185 This certification is a material representation of fact upon which reliance was placed when making an
186 award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous
187 certification, the Federal Aviation Administration may direct through the Owner cancellation of the
188 contract or subcontract for default at no cost to the Owner or the FAA.
189

190 **d. Certification of Offeror/Bidder Regarding Debarment (2 CFR Part 180 (Subpart C), 2 CFR Part**
191 **1200, DOT Order 4200.5)**
192

193 By submitting a bid/proposal under this solicitation, the Bidder or Offeror certifies that neither it nor its
194 principals are presently debarred or suspended by any Federal department or agency from participation
195 in this transaction
196

197 **e. Certification of Lower Tier Contractors Regarding Debarment (2 CFR Part 180 (Subpart C), 2**
198 **CFR Part 1200, DOT Order 4200.5)**
199

200 The successful Bidder, by administering each lower tier subcontract that exceeds \$25,000 as a “covered
201 transaction”, must verify each lower tier participant of a “covered transaction” under the project is not
202 presently debarred or otherwise disqualified from participation in this federally assisted project. The
203 successful bidder will accomplish this by:
204

- 205 1. Checking the System for Award Management at website: <http://www.sam.gov>;
206 2. Collecting a certification statement similar to the Certificate Regarding Debarment and
207 Suspension (Bidder or Offeror), above; and
208 3. Inserting a clause or condition in the covered transaction with the lower tier contract.
209

210 If the FAA and/or MoDOT later determines that a lower tier participant failed to disclose to a higher
211 tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA
212 and/or MoDOT may pursue any available remedies, including suspension and debarment of the non-
213 compliant participant.
214

215 **f. Certification of Offeror/Bidder Regarding Tax Delinquency and Felony Convictions (Section**
216 **415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 and DOT**
217 **Order 4200.6)**
218

219 The applicant must complete the following two certification statements. The applicant must indicate
220 its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in
221 the space following the applicable response. The applicant agrees that, if awarded a contract resulting
222 from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.
223

1. The applicant represents that it is () is not () a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
2. The applicant represents that it is () is not () is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

g. Certification Regarding Lobbying (31 U.S.C. § 1352, 2 CFR § 200 Appendix II(J), 49 CFR Part 20, Appendix A)

The Bidder or Offer certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

4. No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employer of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
5. 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.
6. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

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

h. Buy American Certification: (Title 49 U.S.C. § 50101)

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

A bidder or offeror must submit this Buy America Certification with all bids or offers on AIP funded projects. **Bids or offers that are not accompanied by a completed Buy America Certification must be rejected as nonresponsive.**

The bidder certifies it and all associated subcontractors will comply with the Buy American preferences established under Title 49 U.S.C. Section 50101 as follows:

U.S.C. Section 50101 - Buying goods produced in the United States

- (a) Preference. - The Secretary of Transportation may obligate an amount that may be appropriated to carry out section 106(k), 44502(a)(2), or 44509, subchapter I of chapter 471 (except section 47127), or chapter 481 (except sections 48102(e), 48106, 48107, and 48110) of this title for a project only if steel and manufactured goods used in the project are produced in the United States.
- (b) Waiver. - The Secretary may waive subsection (a) of this section if the Secretary finds that -
- (1) Applying subsection (a) would be inconsistent with the public interest;
 - (2) The steel and goods produced in the United States are not produced in a sufficient and reasonably available amount or are not of a satisfactory quality;
 - (3) When procuring a facility or equipment under section 44502(a)(2) or 44509, subchapter I of chapter 471 (except section 47127), or chapter 481 (except sections 48102(e), 48106, 48107, and 48110) of this title -
 - A. The cost of components and subcomponents produced in the United States is more than 60% of the cost of all components of the facility or equipment; and
 - B. Final assembly of the facility or equipment has occurred in the United States; or
 - (4) Including domestic material will increase the cost of the overall project by more than 25%.
- (c) Labor Costs. - In this section, labor costs involved in final assembly are not included in calculating the cost of components.

* * * * *

Please note that approval of waivers listed under (b) (1) & (2) above, can only be approved by the FAA Office of Airports in Washington DC and approval is rare. Waivers listed under (b) (3) & (4) may be approved by FAA Regional or District Offices.

A listing of Equipment and Products that have been approved and on the national waiver list may be located at:

http://www.faa.gov/airports/aip/buy_american/

310
311 **Certificate of Buy American Compliance for Manufactured Products**

312 (Non-building construction projects, equipment acquisition projects)

313
314 As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification
315 statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC §
316 50101 by selecting one on the following certification statements. These statements are mutually exclusive.
317 Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter “X”.

318 ☐ Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:

- 319 a) Only installing steel and manufactured products produced in the United States, or;
320 b) Installing manufactured products for which the Federal Aviation Administration (FAA) has
321 issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American
322 Waivers Issued listing, or;
323 c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition
324 Regulation Subpart 25.108.

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

- 326 1. To provide to the Owner evidence that documents the source and origin of the steel and
327 manufactured product;
328 2. To faithfully comply with providing U.S. domestic product;
329 3. To furnish U.S. domestic product for any waiver request that the FAA rejects;
330 4. To refrain from seeking a waiver request after establishment of the contract, unless
331 extenuating circumstances emerge that the FAA determines justified.

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

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

344 **Required Documentation**

345 **Type 3 Waiver** - The cost of the item components and subcomponents produced in the United
346 States is more than 60 percent of the cost of all components and subcomponents of the “item”. The
347 required documentation for a type 3 waiver is:

- 348 a) Listing of all product components and subcomponents that are not comprised of 100 percent
349 U.S. domestic content (Excludes products listed on the FAA Nationwide Buy American
350 Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart
351 25.108; products of unknown origin must be considered as non-domestic products in their
352 entirety)
353 b) Cost of non-domestic components and subcomponents, excluding labor costs associated with
354 final assembly at place of manufacture.
355 c) Percentage of non-domestic component and subcomponent cost as compared to total “item”
356 component and subcomponent costs, excluding labor costs associated with final assembly at
357 place of manufacture.

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

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

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

Date

Signature

Company Name

Title

BUY AMERICA WAIVER REQUEST

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

For Airfield Development Projects funded under the Airport Improvement Program

Instructions for Permissible Waivers

Nationwide Waivers: The FAA Office of Airports publishes national waivers for equipment and products that meet Buy American requirements under 49 USC 50101. Nationwide waivers are published at:

http://www.faa.gov/airports/aip/buy_american/

Section 50101(b)(1) & (b)(2) Waivers:

The bidder may request a waiver based upon the best interests of the public, Section 50101 (b)(1) or request a waiver based upon insufficient supply of U.S. manufactured products, Section 50101 (b)(2), however approval is rare and waivers may only be approved by the FAA Office of Airports in Washington DC.

Section 50101(b)(3) Waiver:

The bidder may request a waiver if 60% or more of the components and subcomponents in the facility or equipment are produced in the United States and final assembly occurs in the U.S. Bidder is hereby advised that the Owner's approval with the bidder's waiver request is contingent upon FAA approval.

1. "Equipment" in Section 50101 shall mean the following:
 - a) Individual type "L" items (Airfield Lighting Equipment) as listed in FAA Advisory Circular 150/5345-53.
 - b) Individual bid items as established within FAA Advisory Circular 150/5370-10.
 - c) A waiver request may only address one specific equipment item. Submit separate requests for each equipment item for which a waiver.
 - d) Items listed under the Nationwide Waiver referenced above do not require further review.
2. The bidder must base the U.S. percentage upon the value that results from completing the following Content Percentage Calculation Worksheet. The Bidder must submit the content percentage calculation worksheet as an attachment to the waiver request.
3. Components/subcomponents are the material and products composing the "equipment".
4. The final assembly of the AIP-funded "equipment" must be within the USA (*Section 50101(b)(3)(B)*). Final assembly is the substantial transformation of the components and subcomponents into the end product. Final assembly location is the location where the equipment is assembled, not the project site itself.
5. All steel used in the "Equipment" must be produced in the United States.
6. The Buy American requirements apply to all tier contractors and subcontractors. All contractors/subcontractors are required to provide appropriate documentation that indicates origin of manufacturer and percentage of domestic made product.

7. The bidder is hereby advised there is no implied or expressed guarantee that a requested waiver will be issued by the Federal Aviation Administration (FAA). Less than 60% USA component/subcomponent proposed for this facility CANNOT be waived. Products made with foreign steel are not eligible for a waiver.
8. Products and material made in Canada or Mexico must be considered as foreign made products.
9. Preparation of a Content Percentage Calculation Worksheet is not necessary for equipment listed on the FAA national listing:
http://www.faa.gov/airports/aip/buy_american/
Bidder however shall submit a listing of any equipment it proposes to install on the project that is included on the Nationwide Buy American conformance list.
10. In any calculation of Buy American percentage, the labor for the final assembly is excluded. This is because the Buy American statute is based on the cost of materials and equipment, not Labor.

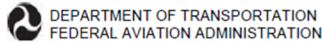
Instructions for Section 50101(b)(4) Waiver:

1. The bidder may request a waiver if application of Buy America preferences results in a 25% cost increase in the overall project. This waiver is rarely applicable. Consult the Owner before making this request.

BUY AMERICA WAIVER REQUEST

Title 49 U.S.C Section 50101 (b)(3)

For Airfield Development Projects funded under the Airport Improvement Program



OMB CONTROL NUMBER: ####-####
EXPIRATION DATE: MM/DD/YYYY

Buy American Content Percentage Calculation Worksheet

Company Name: _____ Date: _____
Address: _____ Point of Contact: _____
Telephone: _____ Fax: _____ Email: _____
Product Structure: Multi-Level Bill of Materials (through level 2 only)
Item Description: _____ Total Material Cost: _____
Address of Final Assembly Location: _____ US Content (%): _____
FAA Item Number (if applicable): _____ Other (%): _____

The undersigned certifies that this information is true and accurate to the best of their knowledge.¹

Signature: _____

Name: _____

Level (0, 1, 2)	Part Number	Description	Quantity Per Unit	Unit of Measure	Price/Unit of Measure	US Origin Price/Unit of Measure ²	US Origin* Cost/Each	Other Price/Unit of Measure	Other Cost/Each

¹ A false certification represents a violation of 18 U.S.C § 1001 and 49 U.S.C § 47126. Signatory has the burden of proof to establish compliance.

² Items listed in Federal Acquisition Regulation Part 25.104 may be counted as US Origin, however should include note stating that item is exempt in 25.104.

FAA Form 5100-136 (1/16)

Certification Signature

Bidder hereby requests a waiver to Buy America preferences based upon Section 50101(b)(3) for the equipment identified above. The bidder certifies that _____% of the cost of components and subcomponents comprising the equipment are produced in the United States and that final assembly occurs within the United States.

I hereby certify the above information is accurate and complete.

Bidder's Firm Name

Date



OMB CONTROL NUMBER: 2120-0569
EXPIRATION DATE: 8/31/2019

Buy American Preferences – Final Assembly Questionnaire

To assist the Federal Aviation Administration (FAA) in making the determination of whether final assembly of the product occurs in the United States, please complete and submit this questionnaire when requesting a Buy American Waiver under 49 USC § 50101(b)(3)(A).

1. Please provide a description of the assembly process occurring at the specified final location in the United States.
2. Please describe the final assembly process and its various operations.
3. How long does the final assembly process take to complete?
4. Please provide a description of the resources used to conduct the assembly of the product at the specified location in the United States.
5. How many employees are involved in the final assembly process and what is the general skill level of those employees?
6. What type of equipment is used during the final assembly process?
7. What is a rough estimate of the associated cost to conduct final assembly of the product at the specified location in the United States?

The undersigned certifies that this information is true and accurate to the best of their knowledge. A false certification represents a violation of 18 U.S.C § 1001 and 49 U.S.C § 47126. Signatory has the burden of proof to establish compliance.

Signature: _____

Name:

FAA Form 5100-137 (4/19) SUPERSEDES PREVIOUS EDITION

BUY AMERICA CONFORMANCE LISTING

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

For Airfield Development Projects funded under the Airport Improvement Program

- Preparation of a Component Cost Calculation Table is not necessary for equipment listed on the FAA national listing: http://www.faa.gov/airports/aip/buy_american/
- Bidder shall submit a listing of equipment it proposes to install on the project that is included on the current National Buy American conformance list.

Equipment Type	Name of Manufacturer	Product Number

Certification Signature:

Bidder hereby certifies that the above listed equipment, which we propose for installation on the subject project, is on the current National Buy America Conformance list as established at:

http://www.faa.gov/airports/aip/buy_american/

I hereby certify the above information is accurate and complete.

Bidder's Firm Name

Date

Signature

428 **i. Compliance with the Work Authorization Law (as required by Section 285.530 Revised**
429 **Statutes of Missouri)**

430
431 For all contracts where the total bid amount is in excess of \$50,000 (local match in excess of \$5,000),
432 the Bidder, by submission of an offer and by signing the Worker Eligibility Verification Affidavit for
433 All Contract Agreements in Excess of \$50,000, certifies that it:

- 434
435 1. does not knowingly employ any person who is an unauthorized alien in connection with
436 the contracted services;
437
438 2. has enrolled and actively participates in a federal work authorization program;
439

440 A general contractor or subcontractor of any tier shall not be liable under sections 285.525 to
441 285.550 when such general contractor or subcontractor contracts with its direct subcontractor who
442 violates subsection 1 of this section, if the contract binding the contractor and subcontractor
443 affirmatively states that the direct subcontractor is not knowingly in violation of subsection 1 of this
444 section and shall not henceforth be in such violation and the contractor or subcontractor receives a
445 sworn affidavit under the penalty of perjury attesting to the fact that the direct subcontractor's
446 employees are lawfully present in the United States

**WORKER ELIGIBILITY VERIFICATION AFFIDAVIT FOR ALL
CONTRACT AGREEMENTS IN EXCESS OF \$50,000
(Local match in excess of \$5,000)**

(for joint ventures, a separate affidavit is required for each business entity)

STATE OF _____)
) ss
COUNTY OF _____)

On this ____ day of _____, 20__, before me appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be a person whose name is subscribed to this affidavit, who being by me duly sworn, deposed as follows:

My name is _____, and I am of sound mind, capable of making this affidavit, and personally certify the facts herein stated, as required by Section 285.530, RSMo, to enter into any contract agreement with the state or any of its political subdivisions to perform any job, task, employment, labor, personal services, or any other activity for which compensation is provided, expected, or due, including but not limited to all activities conducted by business entities:

I am the _____ of _____, and I am duly authorized, directed, (title name) (business name) and/or empowered to act officially and properly on behalf of this business entity.

I hereby affirm and warrant that the aforementioned business entity is enrolled in a federal work authorization program operated by the United States Department of Homeland Security, and the aforementioned business entity shall participate in said program to verify information (employment eligibility) of newly hired employees working in connection to work under the within contract agreement. I have attached documentation to this affidavit to evidence enrollment/participation by the aforementioned business entity in a federal work authorization program, as required by Section 285.530, RSMo.

In addition, I hereby affirm and warrant that the aforementioned business entity does not and shall not knowingly employ, in connection to work under the within contract agreement, any alien who does not have the legal right or authorization under federal law to work in the United States, as defined in 8 U.S.C. § 1324a(h)(3).

I am aware and recognize that, unless certain contract and affidavit conditions are satisfied pursuant to Section 285.530, RSMo, the aforementioned business entity may be held liable under Sections 285.525 through 285.550, RSMo, for subcontractors that knowingly employ or continue to employ any unauthorized alien to work within the state of Missouri.

I acknowledge that I am signing this affidavit as a free act and deed of the aforementioned business entity and not under duress.

(Affiant Signature)

Subscribed and sworn to before me this ____ day of _____, 20__.

(Notary Public)

My commission expires:

[Documentation of enrollment/participation in a federal work authorization program is attached. Acceptable enrollment and participation documentation consists of the following two pages of the E- Verify Memorandum of Understanding: (1) A valid, completed copy of the first page identifying the business entity; and (2) A valid copy of the signature page completed and signed by the business entity, the Social Security Administration, and the Department of Homeland Security – Verification Division.]

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION

The information shown in this section must be completed when a DBE contract goal has been established. The percentage must equal or exceed the DBE contract goal. If the percentage is below the contract goal, then the bidder must submit complete written documentation of good faith efforts taken to meet the DBE contract goal.

Only those firms currently certified as DBEs by the Missouri Department of Transportation (MoDOT), City of St. Louis, Metro, City of Kansas City, and Kansas City Area Transportation Authority are eligible to participate as DBEs on this contract. A list of these firms is available on MoDOT's Office of External Civil Rights webpage at the following address:

<http://www.modot.org/dbe-program>

- a. The undersigned submits the following list of DBEs to be used in accomplishing the work of this contract. The work, supplies or services, applicable value and percent of total federal contract each DBE is to perform or furnish is as follows:
- b. Joint venture with a DBE. The undersigned submits the following list of bid items the DBE prime is responsible for and any items that will be subcontracted out are noted with an asterisk or a similar notation. The work, applicable value and percentage of total federal contract the DBE prime is responsible for are as follows:

(A) DBE Name and Address	(B) Bid Item Number(s) Or Work Performed	(C) Dollar Value of DBE Work **	(D) Percent Applicable to DBE Goal (100%, 60%)	(E) Dollar Amount Applicable to DBE Goal (C x D)	(F) Percent of Total Contract (C / Total Contract Amount)
TOTAL DBE PARTICIPATION				\$	%

**Cannot exceed contract amount for given item of work.

Truck services credited at 100% if the DBE owns the trucks or is leasing from a DBE firm.

Merchant wholesalers (supply) are credited at 60%.

Brokered services will only receive credit for fees.

(Please reproduce the above sheet if additional space is needed.)

CONTRACTOR'S STATEMENT OF QUALIFICATIONS

Qualifications shall be furnished with the bid proposal as described in Section 20 of the General Provisions, including resumes of all key personnel detailing experience on similar airfield construction projects as stated in paragraph 2 of Section 2, Instructions to Bidders.

Name of firm, address with zip code

Project Contact Name.....

Area Code/Telephone Number

Area Code/Fax Number

Federal I.D. Number

The Contractor is **required** to perform an amount equal to or at least **50 percent** of the total contract cost.

% of work by Contractor

No. of permanent employees

No. of years in business

Have you done business under different name? If so, please give name and location.

- Provide list of equipment available for the work.
- Provide resumes of all key personnel that would be available.
- Provide list of projects completed within last five years that are similar in scope to the one being bid, including cost of each, and owner contact information.
- Provide list of projects currently under construction, including costs of each, and owner contact information.
- Provide "evidence of competency" and "evidence of financial responsibility" in accordance with Section 20-02 of the General Provisions. If the Bidder is presently pre-qualified with the Missouri Department of Transportation (MoDOT), evidence of this pre-qualification may serve as evidence of financial responsibility in lieu of the certified financial statements and reports.

Intentionally Left Blank

**THIS EXECUTED PROPOSAL FORM MUST BE SUBMITTED
WITH SECTIONS B-1 THROUGH B-21 FILLED OUT COMPLETELY**

SIGNATURE OF BIDDER

The undersigned states that the correct LEGAL NAME AND ADDRESS of (1) the individual bidder, (2) each partner or joint venturer (whether individuals or corporations, and whether doing business under a fictitious name), or (3) the corporation (with the state in which it is incorporated) are shown below; that (if not signing with the intention to bind themselves to become responsible and sole bidder) they are the agent of, and they are signing and executing this (as indicated in the proper spaces below) as the bid of a

() sole individual () partnership () joint venture
() corporation, incorporated under the laws of state of _____.

Executed by bidder this _____ day of _____, 20____.

Name of individual,
all partners
or joint venturers:

Address of each:

doing business under the name of:

Address of principal place of business in
Missouri:

(If using a fictitious name, show this
name above in addition to legal names)

(If a corporation, show its name above)

ATTEST: (SEAL)

(Signature) Secretary

(Signature) (Title)

Please print name

Please print name

NOTE: If bidder is doing business under a fictitious name, the bid shall be executed in the legal name of the individual partners, joint ventures, or corporation, with the legal address shown, and registration of fictitious name filed with the secretary of state, as required by sections 417.200 to 417.230 RSMo. If the bidder is a corporation not organized under the laws of Missouri, it shall procure a certificate of authority to do business in Missouri, as required by section 351.572 et seq RSMo.

Intentionally Left Blank

PERFORMANCE BOND	BOND NUMBER
PRINCIPAL <i>(Legal Name and Business Address)</i>	
SURETY <i>(Legal Name and Business Address)</i>	STATE OF INCORPORATION
PENAL SUM OF BOND <i>(Expressed in words and numerals)</i>	CONTRACT DATE

OBLIGATION

KNOW ALL PERSONS BY THESE PRESENTS, that the above named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above named SURETY hereby bind themselves unto City of Kirksville, 27161 David Hall Trail, Missouri 63501 as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

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

Schedule I - Runway 18/36 Rehabilitation
Schedule II - Taxiway B Rehabilitation
Schedule III - Remove and Construct Mid-field Connector Taxiway B

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

CONDITION

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

1. SURETY, for value received, hereby stipulates and agrees that no change, extension of time, modification, omission, addition or change in or to the Contract, or the work performed thereunder or the specifications accompanying the same, shall in any way affect the SURETY'S obligation on this bond; and SURETY hereby agrees to waive notice of any and all such extensions, modifications, omissions, alterations, and additions to the terms of the Contract, work or specifications.

- 651 2. Whenever CONTRACTOR shall be and declared by the OWNER to be in default under the Contract,
652 the Surety shall promptly and at the SURETY'S expense remedy the default by implementing one or
653 more of the following actions:
654
- 655 a. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the
656 Contract; or
657
 - 658 b. Undertake to perform and complete the Contract itself, through its agents or through independent
659 contractors; or
660
 - 661 c. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a
662 contract for performance and completion of the Contract; arrange for a contract to be prepared
663 for execution by the OWNER and the contractor selected with the OWNER'S concurrence, to be
664 secured with performance and payment bonds executed by a qualified surety equivalent to the
665 Bonds issued on the Contract; and make available as work progresses (even though there should
666 be a default or a succession of defaults under the contract or contracts of completion arranged
667 under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract
668 price; but not exceeding, including other costs and damages for which the Surety may be liable
669 hereunder, the penal sum of the bond. The term "balance of the contract price", as used in this
670 paragraph, shall mean the total amount payable by OWNER to CONTRACTOR under the
671 Contract and any amendments thereto, disbursed at the rate provided in the original contract, less
672 the amount properly paid by OWNER to CONTRACTOR.
673
 - 674 d. With written consent of the OWNER, SURETY may waive its right to perform and complete,
675 arrange for completion or obtain a new contractor and with reasonable promptness, investigate
676 and determine the amount the SURETY is liable to the OWNER and tender payment therefor to
677 the OWNER.
678
- 679 3. CONTRACTOR and SURETY agree that if in connection with the enforcement of this Bond, the
680 OWNER is required to engage the services of an attorney, that reasonable attorney fees incurred by
681 the OWNER, with or without suit, are in addition to the balance of the contract price.
682
- 683 4. No right of action shall accrue on this bond to or for the use of any person or corporation other than
684 the OWNER named herein or the successors or assigns of the OWNER.
685

WITNESS

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

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST:

Corporate Name: _____

Signature: _____

Signature: _____

Name and Title: _____
(Affix Corporate Seal)

Name and Title: _____

SURETY:

ATTEST:

Surety Name: _____

Signature: _____

Signature: _____

Name and Title: _____
(Affix Seal)

Name and Title: _____
(Attach Power of Attorney)

OWNER ACCEPTANCE:

The OWNER approves the form of this Performance Bond.

Date: _____

Signature: _____

Signature: _____

Name and Title: _____
(Affix Seal)

Name and Title: _____

Intentionally Left Blank

PAYMENT BOND	BOND NUMBER
PRINCIPAL <i>(Legal Name and Business Address)</i>	
SURETY <i>(Legal Name and Business Address)</i>	STATE OF INCORPORATION
PENAL SUM OF BOND <i>(Expressed in words and numerals)</i>	CONTRACT DATE

OBLIGATION

KNOW ALL PERSONS BY THESE PRESENTS, that the above named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above named SURETY hereby bind themselves unto City of Kirksville, 27161 David Hall Trail Missouri as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

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

Schedule I - Runway 18/36 Rehabilitation
Schedule II - Taxiway B Rehabilitation
Schedule III - Remove and Construct Mid-field Connector Taxiway B

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

CONDITION

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

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

- 770
771
772
773
774
775
776
777
778
779
780
4. The amount of this bond shall be reduced by and to the extent of any payments made in good faith hereunder.
 5. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy obligations of the CONTRACTOR and the SURETY under this Bond, subject to the OWNER'S priority to use the funds for the completion of the project.

WITNESS

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

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST:

Corporate Name: _____

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

(Affix Corporate Seal)

SURETY:

ATTEST:

Surety Name: _____

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

(Affix Seal)

(Attach Power of Attorney)

OWNER ACCEPTANCE:

The OWNER approves the form of this Payment Bond.

Date: _____

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

(Affix Seal)

Intentionally Left Blank

FORM OF CONTRACT AGREEMENT

City of Kirksville

State Block Grant Project No. 20-028A-1

THIS AGREEMENT, made as of this _____ day of _____, 20_____, is

BY AND BETWEEN

the OWNER: Name: _____

Address: _____

City/State/Zip Code: _____

And the CONTRACTOR: Name: _____

Address: _____

City/State/Zip Code: _____

WITNESSETH:

WHEREAS it is the intent of the Owner to make improvements at Kirksville Regional Airport generally described as follows;

Schedule I - Runway 18/36 Rehabilitation

Schedule II - Taxiway B Rehabilitation

Schedule III - Remove and Construct Mid-field Connector Taxiway B

hereinafter referred to as the Project.

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

Article 1 – Work

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

Article 2 – Contract Documents

CONTRACTOR agrees that the Contract Documents consist of the following: this Agreement, General Provisions, Supplementary Provisions, Specifications, Drawings, all issued addenda, Notice-to-Bidders, Instructions-to-Bidders, Proposal and associated attachments, Performance Bond, Payment Bond, Wage Rate Determinations, Insurance certificates, documents incorporated by reference, documents incorporated by attachment, and all OWNER authorized change orders issued subsequent to the date of this agreement. All documents comprising the Contract Documents are complementary to one another and together establish the complete terms, conditions and obligations of the CONTRACTOR. All said Contract Documents are incorporated by reference into the Contract Agreement as if fully rewritten herein or attached thereto.

876 **Article 3 – Contract Price**

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

880 _____
881 (Amount in Written Words) (Amount in Numerals)

882 subject to the following;

- 883
884
- 885 **a.** Said amount is based on the schedule of prices and estimated quantities stated in
886 CONTRACTOR'S Bid Proposal, which is attached to and made a part of this Agreement;
 - 887
888 **b.** Said amount is the aggregate sum of the result of the CONTRACTOR'S stated unit prices
889 multiplied by the associated estimated quantities;
 - 890
891 **c.** CONTRACTOR and OWNER agree that said estimated quantities are not guaranteed and that
892 the determination of actual quantities is to be made by the OWNER'S ENGINEER;
 - 893
894 **d.** Said amount is subject to modification for additions and deductions as provided for within the
895 Contract General Provisions.
- 896

897 **Article 4 – Payment**

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

903
904 The acceptance of final payment by the CONTRACTOR shall be considered as a release in full of all claims
905 against the OWNER, arising out of, or by reason of, the work completed and materials furnished under this
906 Contract.

907
908 OWNER shall make progress payments to the CONTRACTOR in accordance with the terms set forth in the
909 General Provisions. Progress payments shall be based on estimates prepared by the ENGINEER for the value
910 of work performed and materials completed in place in accordance with the Contract Drawings and
911 Specifications. Progress payments are subject to retainage requirements as set forth in the General Provisions.

912
913 **Article 5 – Contract Time**

914 The CONTRACTOR agrees to commence work within ten (10) calendar days of the date specified in the
915 OWNER'S Notice-to-Proceed. CONTRACTOR further agrees to complete said work within 110 calendar
916 days of the commencement date stated within the Notice-to-Proceed.

917
918 It is expressly understood and agreed that the stated Contract Time is reasonable for the completion of the
919 Work, taking all factors into consideration. Furthermore, extensions of the Contract Time may only be
920 permitted by execution of a formal modification to this Contract Agreement in accordance with the General
921 Provisions and as approved by the OWNER.

922
923 **Article 6 – Liquidated Damages**

924 The CONTRACTOR and OWNER understand and agree that time is of essence for completion of the Work
925 and that the OWNER will suffer additional expense and financial loss if said Work is not completed within the
926 authorized Contract Time. Furthermore, the CONTRACTOR and OWNER recognize and understand the
927 difficulty, delay, and expense in establishing the exact amount of actual financial loss and additional expense.
928 Accordingly, in place of requiring such proof, the CONTRACTOR expressly agrees to pay the OWNER as
929 liquidated damages the non-penal sum of \$750 per day for each calendar day required in excess of the authorized

Contract Time. In addition, up to \$1,730/Calendar Day(s) for the construction manager plus up to \$1,390/Calendar Day(s) for each additional resident engineer plus any incurred expenses (per diem, lodging, etc.) will be charged to the Contractor for that time which exceeds the number of Calendar days allowed in this paragraph. Further, each phase of work under the project has additional liquidated damage clauses, as outlined in Section 80-08 FAILURE TO COMPLETE ON TIME.

Furthermore, the CONTRACTOR understands and agrees that;

- a. the OWNER has the right to deduct from any moneys due the CONTRACTOR, the amount of said liquidated damages;
- b. the OWNER has the right to recover the amount of said liquidated damages from the CONTRACTOR, SURETY or both.

Article 7 – CONTRACTOR’S Representations

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

Article 8 – CONTRACTOR’S Certifications

The CONTRACTOR understands and agrees that all certifications made by the CONTRACTOR within the Proposal shall apply under this Agreement as if fully rewritten herein. The CONTRACTOR further certifies the following;

a. Certification of Eligibility (29 CFR Part 5.5)

- i. By Entering into this contract, the CONTRACTOR certifies that neither he or she nor any person or firm who has an interest in the CONTRACTOR’S firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1);
- ii. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1);
- iii. The penalty for making false statements is prescribed in the U.S. Criminal Code 18 U.S.C.

b. Certification of Non-Segregated Facilities (41 CFR Part 60-1.8)

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

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The Bidder agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of

subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that it will retain such certifications in its files.

Article 9 – Miscellaneous

- a.** CONTRACTOR understands that it shall be solely responsible for the means, methods, techniques, sequences and procedures of construction in connection with completion of the Work;
- b.** CONTRACTOR understands and agrees that it shall not accomplish any work or furnish any materials that are not covered or authorized by the Contract Documents unless authorized in writing by the OWNER or ENGINEER;
- c.** The rights of each party under this Agreement shall not be assigned or transferred to any other person, entity, firm or corporation without prior written consent of both parties;
- d.** OWNER and CONTRACTOR each bind itself, their partners, successors, assigns and legal representatives to the other party in respect to all covenants, agreements, and obligations contained in the Contract Documents.

Article 10 – OWNER’S Representative

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

**Jviation, a Woolpert Company
720 South Colorado Boulevard, Suite 1200-S
Glendale, CO 80246**

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

IN WITNESS WHEREOF, OWNER and CONTRACTOR have executed five (5) copies of this Agreement on the day and year first noted herein.

OWNER

CONTRACTOR

Name: _____

Name: _____

Address: _____

Address: _____

By: _____

By: _____

Signature

Signature

Title of Representative

Title of Representative

ATTEST:

ATTEST:

By: _____

By: _____

Signature

Signature

Title

Title

Printed February 16, 2021 @ 3:51 PM by Kevin Scherr
J:\WORK\2020\20-028A-1\REV B\KIRKSVILLE\CD\PLANS\2000\IRK-20-01-C002-INDX.dwg

INDEX OF DRAWINGS		
SHEET NO.	SHEET NAME	SHEET TITLE
1	G001	COVER SHEET
2	G002	INDEX OF DRAWINGS & QUANTITIES
3	G003A	GENERAL NOTES
4	G003B	GENERAL NOTES
5	G004	MASTER LEGEND AND ABBREVIATIONS
6	G005	SURVEY CONTROL PLAN
7	G006	GEOTECHNICAL INVESTIGATION PLAN
8	G007	GEOTECHNICAL INVESTIGATION - SOIL BORING LOGS
9	G030	ENVIRONMENTAL REQUIREMENTS
10	G050	CONSTRUCTION LAYOUT PLAN - OVERALL PHASING PLAN
11	G051	CONSTRUCTION SAFETY NOTES AND DETAILS
12	G052	CONSTRUCTION SAFETY DRAWING - SCHEDULE I & II, PHASE 1
13	G053	CONSTRUCTION SAFETY DRAWING - SCHEDULE I, PHASE 2
14	G054	CONSTRUCTION SAFETY DRAWING - SCHEDULE I & II, PHASE 3
15	G055	CONSTRUCTION SAFETY DRAWING - SCHEDULE III, PHASE 4
16	G056	CONSTRUCTION SAFETY DRAWING - SCHEDULE I, PHASE 2, DISPLACED THRESHOLD MARKING
17	G057	CONSTRUCTION SAFETY DRAWING - SCHEDULE I, PHASE 3, DISPLACED THRESHOLD MARKING
18	G058	TEMPORARY RELOCATED THRESHOLD DETAILS
19	C100	DEMOLITION PLAN - TAXIWAY B STA. 30+00 TO STA. 36+50, OFFSET 0.00' TO 319.26' RIGHT, RUNWAY 18/36
20	C101	DEMOLITION PLAN - TAXIWAY B STA. 30+00 TO STA. 36+50, OFFSET 319.26' TO 382.37' RIGHT, RUNWAY 18/36
21	C200	REHAB/REPLACE LAYOUT PLAN STA. 0+00 TO STA. 3+00 RUNWAY 18/36
22	C201	REHAB/REPLACE LAYOUT PLAN STA. 3+00 TO STA. 9+50 RUNWAY 18/36
23	C202	REHAB/REPLACE LAYOUT PLAN STA. 9+50 TO STA. 16+00 RUNWAY 18/36
24	C203	REHAB/REPLACE LAYOUT PLAN STA. 16+00 TO STA. 22+50 RUNWAY 18/36
25	C204	REHAB/REPLACE LAYOUT PLAN STA. 22+50 TO STA. 29+00 RUNWAY 18/36
26	C205	REHAB/REPLACE LAYOUT PLAN STA. 29+00 TO STA. 35+50 RUNWAY 18/36
27	C206	REHAB/REPLACE LAYOUT PLAN STA. 35+50 TO STA. 42+00 RUNWAY 18/36
28	C207	REHAB/REPLACE LAYOUT PLAN STA. 42+00 TO STA. 48+50 RUNWAY 18/36
29	C208	REHAB/REPLACE LAYOUT PLAN STA. 48+50 TO STA. 55+00 RUNWAY 18/36
30	C209	REHAB/REPLACE LAYOUT PLAN STA. 55+00 TO STA. 60+04 RUNWAY 18/36
31	C210	REHAB/REPLACE LAYOUT PLAN STA. 29+00 TO STA. 35+50 RUNWAY 18/36
32	C211	GEOMETRY PLAN - TAXIWAY B
33	C250	PAVEMENT REPAIR DETAILS
34	C300	GRADING PLAN STA. 29+00 TO STA. 42+00 RUNWAY 18/36
35	C320	SPOT ELEVATION PLAN - TAXIWAY B
36	C321	SPOT ELEVATION PLAN - TAXIWAY B
37	C322	SPOT ELEVATION PLAN - TAXIWAY B
38	C323	SPOT ELEVATION PLAN - TAXIWAY B
39	C500	PAVEMENT PLAN AND PROFILE
40	C700	PAVEMENT MARKING PLAN STA. 0+00 TO STA. 3+00 RUNWAY 18/36
41	C701	PAVEMENT MARKING PLAN STA. 3+00 TO STA. 9+50 RUNWAY 18/36
42	C702	PAVEMENT MARKING PLAN STA. 9+50 TO STA. 16+00 RUNWAY 18/36
43	C703	PAVEMENT MARKING PLAN STA. 16+00 TO STA. 22+50 RUNWAY 18/36
44	C704	PAVEMENT MARKING PLAN STA. 22+50 TO STA. 29+00 RUNWAY 18/36
45	C705	PAVEMENT MARKING PLAN STA. 29+00 TO STA. 35+50 RUNWAY 18/36
46	C706	PAVEMENT MARKING PLAN STA. 35+50 TO STA. 42+00 RUNWAY 18/36
47	C707	PAVEMENT MARKING PLAN STA. 42+00 TO STA. 48+50 RUNWAY 18/36
48	C708	PAVEMENT MARKING PLAN STA. 48+50 TO STA. 55+00 RUNWAY 18/36
49	C709	PAVEMENT MARKING PLAN STA. 55+00 TO STA. 60+04 RUNWAY 18/36
50	C710	PAVEMENT MARKING PLAN STA. 29+00 TO STA. 35+50 RUNWAY 18/36
51	C711	PAVEMENT MARKING PLAN STA. 35+50 TO STA. 42+00 RUNWAY 18/36
52	C750	PAVEMENT MARKING DETAILS
53	C800	JOINT LAYOUT PLAN - TAXIWAY B
54	C850	JOINT DETAILS
55	C900	SEEDING AND EROSION CONTROL PLAN STA. 29+00 TO STA. 42+00 RUNWAY 18/36
56	C950	SEEDING AND EROSION CONTROL DETAILS
57	C951	SEEDING AND EROSION CONTROL DETAILS
58	E001	ELECTRICAL LEGEND AND NOTES
59	E200	ELECTRICAL LAYOUT SHEET TAXIWAY B
60	E250	ELECTRICAL DETAILS
61	E251	ELECTRICAL DETAILS

SUMMARY OF APPROXIMATE QUANTITIES								
ITEM NO.	ITEM DESCRIPTION	UNITS	SCHEDULE I		SCHEDULE II		SCHEDULE III	
			ESTIMATE	AS BUILT	ESTIMATE	AS BUILT	ESTIMATE	AS BUILT
C-100a	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1		1		1	
C-102a	TEMPORARY EROSION CONTROL	LS	1		1		1	
C-105a	MOBILIZATION	LS	1		1		1	
P-101a	FULL DEPTH PAVEMENT REMOVAL (COMPLETE)	SY	0		0		3,250	
P-101b	SPALL REPAIR (COMPLETE)	SF	4,000		140		0	
P-101c	CRACK REPAIR (COMPLETE)	LF	6,000		600		0	
P-101d	PANEL REMOVAL AND REPLACEMENT (COMPLETE)	SY	4,280		620		0	
P-101e	REMOVE AND REPLACE JOINT SEALANT (COMPLETE)	LF	90,000		3,400		0	
P-152a	UNCLASSIFIED EXCAVATION	CY	0		0		3,200	
P-155a	LIME-TREATED SUBGRADE	SY	0		0		3,070	
P-155b	HYDRATED LIME	TON	0		0		180	
P-209a	CRUSHED AGGREGATE BASE COURSE (6-INCHES)	CY	0		0		250	
P-209b	STABILIZATION FABRIC	SY	0		0		3,070	
P-501a	PORTLAND CEMENT CONCRETE PAVEMENT	SY	0		0		3,070	
P-620a	TEMPORARY PAVEMENT MARKING	SF	55,000		0		1,000	
P-620b	PERMANENT PAVEMENT MARKINGS	SF	85,500		210		1,000	
P-620c	BLACK PAVEMENT MARKINGS	SF	28,000		500		1,850	
P-620d	PAVEMENT MARKING OBLITERATION	SF	85,000		0		300	
P-620e	THERMAPLASTIC HOLD POSITION SIGNS	EA	0		0		2	
T-901a	SEEDING WITH HYDROMULCH	AC	0		0		2	
L-108a	INSTALL #8 AWG, L-824C, 5000V, WIRE	LF	0		0		4,930	
L-108b	INSTALL #6 AWG, BARE COPPER COUNTERPOISE INCLUDING GROUND RODS AND TERMINATIONS	LF	0		0		3,210	
L-110a	INSTALL 1-2" SCH. 40 PVC DUCT, DIRECT EARTH BURIED	LF	0		0		2,950	
L-110b	INSTALL 1-2" SCH. 40 PVC DUCT, CONCRETE ENCASED	LF	0		0		190	
L-110c	INSTALL 4-2" SCH. 40 PVC DUCT, CONCRETE ENCASED	LF	0		0		70	
L-115a	REMOVE L-867B JUNCTION BOX, COMPLETE	EA	0		0		3	
L-115b	INSTALL L-867B JUNCTION BOX, COMPLETE	EA	0		0		2	
L-125a	REMOVE TAXIWAY EDGE LIGHT, COMPLETE	EA	0		0		24	
L-125b	REMOVE RUNWAY IN-PAVEMENT LIGHT, COMPLETE	EA	0		0		1	
L-125c	INSTALL L-862 RUNWAY EDGE LIGHT, BASE MOUNTED, WHITE/WHITE LENS, COMPLETE	EA	0		0		1	
L-125d	REINSTALL L-861T LED TAXIWAY EDGE LIGHT	EA	0		0		24	
L-125e	INSTALL L-861T LED TAXIWAY EDGE LIGHT	EA	0		0		17	
L-125f	REMOVE L-858 GUIDANCE SIGN, COMPLETE	EA	0		0		4	
L-125g	REINSTALL 1 MODULE L-858 GUIDANCE SIGN ON NEW CONCRETE PAD WITH NEW ADDITIONAL MODULE AND FOUR NEW PANELS, COMPLETE	EA	0		0		2	
L-125h	REINSTALL 2 MODULE L-858 GUIDANCE SIGN ON NEW CONCRETE PAD WITH NEW ADDITIONAL MODULE AND SIX NEW PANELS, COMPLETE	EA	0		0		1	
L-125i	REINSTALL 3 MODULE L-858 GUIDANCE SIGN ON NEW CONCRETE PAD WITH SIX NEW PANELS, COMPLETE	EA	0		0		1	
L-125j	EXTEND EXISTING 1 MODULE L-858 GUIDANCE SIGN BASE TO 2 MODULE BASE AND INSTALL 4 NEW PANELS, COMPLETE	EA	0		0		4	
L-125k	EXTEND EXISTING 2 MODULE L-858 GUIDANCE SIGN BASE TO 3 MODULE BASE AND INSTALL 6 NEW PANELS, COMPLETE	EA	0		0		1	
L-125l	REMOVE EXISTING PANELS FROM 2 MODULE L-858 GUIDANCE SIGN AND INSTALL 4 NEW PANELS, COMPLETE	EA	0		0		2	
L-125m	REMOVE EXISTING PANELS FROM 3 MODULE L-858 GUIDANCE SIGN AND INSTALL 6 NEW PANELS, COMPLETE	EA	0		0		3	

ISSUED FOR BID

THESE DRAWINGS ARE FOR BIDDING PURPOSES ONLY. THEY WERE PREPARED BY OR UNDER THE SUPERVISION OF;

BRYAN S. GREGORY PE-2006019659 01/31/21
NAME REG. NO. DATE
FOR AND ON BEHALF OF JVIATION , INC.



KIRKSVILLE
REGIONAL AIRPORT
KIRKSVILLE, MISSOURI



DES: D.W.C.

DR: F.V.

CH: C.L.G.

APP: B.S.G.

ISSUE RECORD

NO.	BY	DATE	DESCRIPTION
1	B.S.G.	01/31/21	ISSUED FOR BID
2	B.S.G.	02/16/21	ADDENDUM NO. 1

RUNWAY 18/36 AND
TAXIWAY B
REHABILITATION

INDEX OF DRAWINGS &
QUANTITIES

MoDOT PROJ. NO.
20-028A-1

JVIATION PROJ. NO.
2020.IRK.01

SHEET NAME

G002

SHEET NO.

2 of 62