

BIDDING REQUIREMENTS,
SPECIFICATIONS
and
CONTRACT DOCUMENTS
to

Taxiway E, F, and G Reconstruction at Four Corners Regional Airport



PROJECT NO. AIP 3-35-0016-039-2016
BID NO. 17-119587

**CITY OF FARMINGTON
NEW MEXICO**



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FOUR CORNERS REGIONAL AIRPORT

FARMINGTON, NEW MEXICO

Contract Documents including Detailed Specifications

A.I.P. PROJECT No. 3-35-0016-039-2016
D.O.T. No. FMN-16-03
A.C.I. No. 166351

CERTIFICATION

I hereby certify that these plans and specifications for Four Corners Regional Airport Improvements, A.I.P. Project No. 3-35-0016-039-2016, were prepared under my direct supervision for the Owners thereof.

Designed by:


Engineer


Date

Reviewed by and prepared under my direct supervision:


Registered Professional Engineer


Date

ARMSTRONG CONSULTANTS, INC.

Airport Engineering, Planning & Environmental Studies
2305 Renard Place SE, Ste 210
Albuquerque, NM 87106
Phone: 505-508-2192
Fax: 505-508-2795
www.armstrongconsultants.com

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TOMMY ROBERTS, MAYOR

CITY COUNCIL MEMBERS:

Linda G. Rodgers (District 1)
Sean E. Sharer (District 2)
Gayla McCulloch (District 3)
Nathan Duckett (District 4)

CITY MANAGER:

Robert Mayes

CITY CLERK:

Dianne Smylie, MMC

CITY ATTORNEY:

Jennifer Breakell

ADMINISTRATIVE SERVICES DIRECTOR:

H. Andrew Mason, CPFO

AIRPORT MANAGER:

Mike Lewis

ENGINEER:

Armstrong Consultants

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I BIDDING FORMS & REQUIREMENTS

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TAB I
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BIDDING FORMS

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CONTRACTOR'S CHECKLIST	FORM AF-1(b).FAA
ADVERTISEMENT FOR BIDS	FORM AF-2.FAA
BID PROPOSAL	FORM AF-3
BIDDER'S ESTIMATE OF TAXES	FORM AF-4
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TAXIWAY E, F, AND G RECONSTRUCTION AT FOUR CORNERS REGIONAL AIRPORT
PROJECT #AIP 3-35-0016-039-2016
BID #17-119587
JULY 18, 2017
2:00 P.M.

ACKNOWLEDGMENT OF RECEIPT FORM

In acknowledgment of receipt of the distribution packet #17-119587, the undersigned agrees that he/she has received a complete copy, beginning with the title page and ending with the Soils Boring Log, reference Form AF-1 (b), Contractor's Checklist, for a detailed list of documents.

In order to receive copies of all future communications, relating to, and including amendments to this distribution packet #17-119587, return this acknowledgement form no later than July 11, 2017. Returning this form is not mandatory to submit a bid.

By completing and returning this form, your company will be added to the Plan Holder's List.

FIRM: _____

PRIME CONTRACTOR: ☐ SUB-CONTRACTOR: ☐ (Check One)

REPRESENTED BY: _____

TITLE: _____ PHONE NO.: _____

EMAIL: _____ FAX NO.: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

SIGNATURE: _____ DATE: _____

This name and address will be used for all correspondence related to document #17-119587.

Firm **does/does not (circle one)** intend to respond to Taxiway E, F, and G Reconstruction at Four Corners Regional Airport, #17-119587.

If firm **does not** intend to reply, please give a brief reason for not responding.

Return To:

Jennifer Rowland, CPPB
Buyer II
City of Farmington
Central Purchasing
800 Municipal Drive
Farmington, NM 87401
jlrowland@fmtn.org
Telephone Number: 505-599-1386
Fax Number: 505-599-1377
Faxed copies of this form will be accepted.
Faxed Bid responses **will not** be accepted.

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**INVITATION TO BID
CONSTRUCTION CONTRACT**

PROJECT TITLE: Taxiway E, F, and G
Reconstruction at Four Corners Regional
Airport

PROJECT NO.: AIP 3-35-0016-039-2016

BID NO.: 17-119587

PROJECT DESCRIPTION: The work to be performed under this contract shall consist of furnishing all labor, equipment, and materials. Taxiway E, F, and G will be reconstructed to include pavement removal, excavation, subbase course, base course, asphalt paving, electrical, and pavement marking.

Sealed bid opening
CITY OF FARMINGTON CENTRAL PURCHASING DEPARTMENT.
805 MUNICIPAL DRIVE, FARMINGTON, NM 87401
DATE: JULY 18, 2017 2:00 P.M.

CHIEF PROCUREMENT OFFICER:

Kristi Benson, CPPO, CPPB

If you have any questions regarding this Invitation to Bid, or regarding the Drawings and Specifications during the bidding phase, please contact:

Jennifer Rowland, CPPB, Buyer II
Telephone Number: (505) 599-1386

For assistance during construction phase:

Eric F. Rivera
Telephone Number: (970) 242-0101

PRE-BID CONFERENCE
DATE: July 11, 2017
TIME: 10:00 AM
PLACE: Airport Conference Room, 1300 Navajo St., Farmington, NM

IMPORTANT - BIDS MUST BE SUBMITTED IN A SEALED ENVELOPE WITH THE BID NUMBER AND OPENING DATE CLEARLY INDICATED ON THE BOTTOM LEFT HAND SIDE OF THE FRONT OF THE ENVELOPE.

Sealed bids will be received until the above specified date and local time, then publicly opened at the City of Farmington Central Purchasing Department and read aloud.

This bid is subject to the Purchase Order "Terms and Conditions", Bidding Requirements, Conditions of the Contract, Special Conditions, and Technical Specifications.

BIDDER MUST COMPLETE THE FOLLOWING

COMPANY NAME/MAILING ADDRESS/CITY/STATE/ZIP CODE

CONTACT PERSON

TELEPHONE NUMBER

****To be a valid bid, Bidder must Sign Here****

TITLE

EMAIL ADDRESS

If a corporation, state of incorporation: _____

Prompt Payment Discount _____ (Discount will not be considered in computing the low bid.) F.O.B. Point must be Destination, unless otherwise indicated by the City of Farmington Purchasing Agent and/or enclosed Contract Documents.

NEW MEXICO CONTRACTORS LICENSE NO. _____ TAX I.D. NO. _____

NEW MEXICO CONTRACTORS LICENSE CLASSIFICATION(S): _____

NEW MEXICO DEPARTMENT OF WORKFORCE SOLUTIONS – PUBLIC WORKS REGISTRATION NO. _____

The bidder shall complete the following statement by checking the appropriate space.

The bidder, has _____ has not _____, participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The bidder has _____ has not _____ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontracts.

If the bidder has participated in a previous contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the bidder shall submit a compliance report on Standard Form 100, "Employee Information Report EEO-1" prior to the award of contract.

Standard Form 100 is normally furnished contractors annually, based on a mailing list currently maintained by the Joint Reporting Committee. In the event a contractor has not received the form, he may obtain it by writing to the following address: Joint Reporting Committee, 1800 G Street, Washington, DC 20506.

If applicable, BIDDER ACKNOWLEDGES RECEIPT OF THE FOLLOWING ADDENDUM/ADDENDA:

Addendum No. ____ Dated _____

Addendum No. ____ Dated _____

Addendum No. ____ Dated _____

Addendum No. ____ Dated _____

CITY OF FARMINGTON FORM AF-1(a).FAA

The undersigned bidder, having familiarized himself with the conditions affecting the performance of the work and with the Contract Documents, including the Advertisement for Bids, Instruction to Bidders, Bid Proposal, Bid Bond, Agreement, Performance Bond, Labor, Material, and Tax Payment Bond, Notice of Award, Notice to Proceed, Conditions of Contract, Special Conditions, Drawings, Specifications and all Addenda thereto, as prepared by the City of Farmington, all of which are made a part hereof, hereby proposes, in accordance with said Contract Documents, to furnish all plans, equipment, labor, materials and supervision to perform the work summarized hereafter on each Bid Schedule upon which a proposal amount is inserted.

The total bid for each Bid Schedule includes all work necessary to complete that portion of the project described in each Bid Schedule, and the total of all Bid Schedules represents the entire scope of work covered by the Contract Documents. If a particular item of work is not specifically separated as a bid item, the cost therefore shall be included in the bid item most nearly related.

The total bid for each Bid Schedule is based on the quantities shown in this Bid Proposal and on the dimensions shown on the plans where specific quantities are not itemized. When Bid Schedules are based upon unit prices, the Contract Amount will be adjusted by change order at the corresponding unit prices according to the actual quantities and measurement of the finished construction as determined by the Field Engineer upon completion of construction.

Supplemental unit prices may, when included in this Bid Proposal, be used as a basis to adjust the Contract Amount by change order should it become necessary, in the opinion of the Owner or Engineer, to add or deduct work not otherwise subject to adjustment by stipulated unit prices.

If awarded a contract, the undersigned Bidder agrees to complete the work for final acceptance within the following number of calendar days after issuance of the Notice to Proceed.

Schedule I: 20 Calendar days

Schedule IV: 10 Calendar days

Schedule II: 20 Calendar days

Schedule III: 25 Calendar days

Bidder further agrees to pay as liquidated damages, the following sums for each consecutive calendar day thereafter that the work remains uncompleted:

\$1,500/day

Attached hereto is the required proposal guarantee described as follows:

The proposal guarantee shall be 5% of the total amount bid.

The Engineers Estimate is \$4,000,000

Subcontractor's listing threshold \$20,000

The bidder certifies that this bid is genuine and is not made in the interest of, or on the behalf of, any undisclosed person, firm, or corporation, and that this bid has been arrived at independently, without consultation, communication or agreement as to any matter related to this bid with any other Bidder or competitor.

The entire Invitation to Bid includes the following. Please verify that all the documents listed below are included in your Bid Packet. If your bid contains less, please advise immediately the City of Farmington, Central Purchasing Department, Attention: Jennifer Rowland, CPPB, 800 Municipal Drive, Farmington, New Mexico, 87401, (505) 599-1386. Bidders will be responsible for completing and returning the Acknowledgment of Receipt Form when downloading the documents in order to be added to the Plan Holder's List and to receive any future communications regarding this Bid.

TAB I: BIDDING FORMS & BIDDING REQUIREMENTS

ACKNOWLEDGMENT OF RECEIPT FORM
 INVITATION TO BID - CONSTRUCTION CONTRACT
 CONTRACTOR'S CHECKLIST
 ADVERTISEMENT FOR BIDS
 BID PROPOSAL
 BIDDER'S ESTIMATE OF TAXES
 CONTRACTOR'S LIST OF SUBCONTRACTORS
 BID BOND
 BIDDER'S QUALIFICATIONS
 DRUG-FREE WORKPLACE CERTIFICATION
 CONTRACTOR SAFETY CERTIFICATION
 STATE OF NEW MEXICO MINIMUM WAGE RATES
 BIDDING REQUIREMENTS

TAB II: SPECIAL CONDITIONS

TAB III: TECHNICAL SPECIFICATIONS

TAB IV: CONDITIONS OF CONTRACT

TAB V: CONTRACT FORMS

NOTICE OF AWARD
 AGREEMENT
 PERFORMANCE BOND
 LABOR, MATERIAL AND TAX PAYMENT BOND
 CERTIFICATE OF INSURANCE
 NOTICE TO PROCEED
 CHANGE ORDER
 CERTIFICATE OF SUBSTANTIAL COMPLETION
 RELEASE AND WAIVER OF LIENS
 SUBCONTRACTOR'S RELEASE AND
 WAIVER OF LIENS
 CONTRACTOR'S STATEMENT CONCERNING CLAIMS
 WAIVER FOR PARTIAL PAYMENTS

TAB VI: FEDERAL DOCUMENTS

CAMPAIGN CONTRIBUTION DISCLOSURE FORM
 EQUAL EMPLOYMENT OPPORTUNITY STATEMENT
 LETTER OF INTENT
 BIDDERS LIST
 CERTIFICATION OF NONSEGREGATED FACILITIES
 BUY AMERICAN CERTIFICATION
 FEDERAL WAGE DECISION
 SUPPLEMENTAL INSTRUCTIONS TO BIDDERS
 CERTIFICATION OF INCLUSION OF LABOR & EEO REQUIREMENTS
 SUPPLEMENTAL CONTRACT ARTICLES
 GENERAL PROVISIONS
 SPECIAL PROVISIONS
 ACCEPTANCE TESTING CHECKLIST
 ACCEPTANCE AND QUALITY CONTROL FORMS
 SOILS BORING LOG

CONTRACTOR'S CHECKLIST

FORM AF-1(a)	_____
FORM AF-1(b)	_____
FORM AF-2	_____
FORM AF-3	_____
FORM AF-4	_____
FORM AF-5	_____
FORM AF-6	_____
FORM AF-8	_____
FORM AF-25	_____
FORM AF-26	_____
BR-1 thru BR-6	_____
SC-1 thru SC-2	_____
S-1-1 thru L-125-9	_____
CC-1 thru CC-21	_____
FORM AF-9	_____
FORM AF-10	_____
FORM AF-11	_____
FORM AF-12	_____
ACORD 25	_____
FORM AF-14	_____
FORM AF-15	_____
FORM AF-16	_____
FORM AF-18	_____
FORM AF-19	_____
FORM AF-20	_____
FORM AF-21	_____

DRAWINGS – REFERENCE WEB SITE

BID RESPONSES MUST INCLUDE THE FORMS LISTED BELOW PROPERLY COMPLETED AND EXECUTED. FAILURE TO RETURN THESE DOCUMENTS MAY BE CAUSE FOR CONSIDERING YOUR BID NON-RESPONSIVE.

		CONTRACTOR'S CHECKLIST	CITY'S CHECKLIST
INVITATION TO BID CONSTRUCTION CONTRACT	FORM AF-1(a).FAA	_____	_____
CONTRACTOR'S LICENSE & CLASSIFICATIONS		_____	_____
CONTRACTOR'S CHECKLIST	FORM AF-1(b).FAA	_____	_____
BID PROPOSAL	FORM AF-3	_____	_____
BIDDER'S ESTIMATE OF TAXES	FORM AF-4	_____	_____

CITY OF FARMINGTON FORM AF-1(b).FAA

CONTRACTOR'S LIST OF SUBCONTRACTORS	FORM AF-5	<hr/>	<hr/>
BID BOND & POWER OF ATTORNEY	FORM AF-6	<hr/>	<hr/>
BIDDER'S QUALIFICATIONS	FORM AF-8	<hr/>	<hr/>
DRUG-FREE WORKPLACE CERTIFICATION	FORM AF-25	<hr/>	<hr/>
CONTRACTOR SAFETY CERTIFICATION	FORM AF-26	<hr/>	<hr/>

FAA FORMS:			
CAMPAIGN CONTRIBUTION DISCLOSURE FORM		<hr/>	<hr/>
EQUAL EMPLOYMENT OPPORTUNITY STATEMENT		<hr/>	<hr/>
LETTER OF INTENT		<hr/>	<hr/>
BIDDERS LIST		<hr/>	<hr/>
CERTIFICATION OF NONSEGREGATED FACILITIES		<hr/>	<hr/>
BUY AMERICAN CERTIFICATION		<hr/>	<hr/>

CITY OF FARMINGTON, NEW MEXICO
NOTICE TO CONTRACTORS
TAXIWAY E, F, AND G RECONSTRUCTION AT FOUR CORNERS REGIONAL AIRPORT,
PROJECT # AIP 3-35-0016-039-2016,
BID # 17-119587
JULY 18, 2017 @ 2:00 P.M.

A plan holder's list, drawings, specifications and other contract documents may be retrieved by accessing the Purchasing page of the City of Farmington website, fmrn.org, by calling (505) 599-1373 or visiting the Central Purchasing Office at 805 Municipal Drive, Farmington, New Mexico. A pre-bid conference will be held at the Airport Conference Room, 1300 Navajo St., Farmington, NM, at 10:00 am on July 11, 2017.

The above document has been issued by the City of Farmington for a competitive solicitation. Interested parties may obtain documents as described above.

The proposed contract is subject to the Buy American provision under Section 9129 of the Aviation Safety and Capacity Expansion Act of 1990. Details of such requirement are contained in the contract documents.

It is the policy of the Department of Transportation (DOT) 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.

All bidders shall make good faith efforts, as defined in Appendix A of 49 CFR Part 26, Regulations of the Office of the Secretary of Transportation, to subcontract at least 4.70% of the dollar value of the prime contract to small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE). In the event that the bidder for this solicitation qualifies as a DBE, the contract goal shall be deemed to have been met. Individuals who are rebuttably presumed to be socially and economically disadvantaged include women, Blacks, Hispanics, Native Americans, Asian-Pacific Americans and Asian-Indian Americans. The apparent successful bidder will be required to submit information concerning the DBE's that will participate in this contract. The information will include the name and address of each DBE, a description of the work to be performed by each named firm, and the dollar value of the contract (subcontract). If the bidder fails to achieve the contract goal as stated herein, it will be required to provide documentation demonstrating that it made good faith efforts in attempting to do so. A bid that fails to meet these requirements will be considered nonresponsive.

The following Federal contract provisions are incorporated by reference, the complete language is contained in the bid documents:

Provisions for all Construction Contracts

- Buy American Preference - Title 49 U.S.C., Chapter 501
 - FAA Program Guidance Letter 10-02 "Guidance for Buy American on Airport Improvement Program (AIP) or American Recovery and Reinvestment Act (ARRA) projects."
- Civil Rights Act of 1964, Title VI - Contractor Contractual Requirements - 49 CFR Part 21
- Airport and Airway Improvement Act of 1982, Section 520 - Title 49 U.S.C. 47123
- Lobbying and Influencing Federal Employees - 49 CFR Part 20

- Access to Records and Reports - 49 CFR Part 18.36
- Disadvantaged Business Enterprise - 49 CFR Part 26
- Energy Conservation - 49 CFR Part 18.36
- Breach of Contract Terms - 49 CFR Part 18.36
- Rights to Inventions - 49 CFR Part 18.36
- Trade Restriction Clause - 49 CFR Part 30
- Veteran's Preference - Title 49 U.S.C 47112

Additional Provisions for Construction Contracts Exceeding \$2,000

- Davis Bacon Labor Provisions - 29 CFR Part 5

Additional Provisions for Construction Contracts Exceeding \$10,000

- Equal Opportunity Clause - 41 CFR Part 60-1.4
- Certification of Non-Segregated Facilities - 41 CFR Part 60-1.8
- Notice of Requirement for Affirmative Action - 41 CFR Part 60-4.2
- Equal Employment Opportunity Specification - 41 CFR Part 60-4.3
- Termination of Contract - 49 CFR Part 18.36

Additional Provisions for Construction Contracts Exceeding \$25,000

- Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - 49 CFR Part 29

Additional Provisions for Construction Contracts Exceeding \$100,000

- Contract Workhours and Safety Standards Act Requirements - 29 CFR Part 5
- Clean Air and Water Pollution Control - 49 CFR Part 18.36(i)(12)

June 18, 2017

First Publication Date

July 2, 2017

Second Publication Date

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

Taxiway E, F, and G Reconstruction
PROJECT # AIP 3-35-0016-039-2016
BID #17-119587
BID OPENING: July 18, 2017 at 2:00 P.M.

SCHEDULE I – RECONSTRUCT CONNECTOR TAXIWAY G						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
1	S-1	Mobilization	1	LS	\$	\$
2	S-2a	Remove and Salvage Asphalt Mat (Rotomill Full Depth)	3,480	SY	\$	\$
3	S-2b	Remove Concrete Encased Duct Bank	1	EA	\$	\$
4	S-3b	Adjust Height of Taxiway Edge Lights	1	LS	\$	\$
5	S-6	Watering	Incidental		Incidental	
6	P-151	Clearing and Grubbing	Incidental		Incidental	
7	P-152a	Unclassified Excavation	2,770	CY	\$	\$
8	P-152b	Shoulder Grading	800	SY	\$	\$
9	P-154	Subbase Course (18 Inches Thick)	3,555	SY	\$	\$
10	P-156	Temporary Air and Water Pollution, Soil Erosion and Siltation Control	Incidental		Incidental	
*11	P-401a	Bituminous Base Course (4 Inches Thick)	840	TON	\$	\$
*12	P-401b	Bituminous Material (PG 70-22) (Base)	59	TON	\$	\$
13	P-401c	Bituminous Surface Course (4 Inches Thick)	820	TON	\$	\$
14	P-401d	Bituminous Material (PG 70-22)	58	TON	\$	\$
15	P-602	Bituminous Prime Coat	5	TON	\$	\$

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE I CONTINUED - RECONSTRUCT CONNECTOR TAXIWAY G						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
16	P-603	Bituminous Tack Coat	Incidental		Incidental	
17	P-610	Structural Portland Cement Concrete	Incidental		Incidental	
18	P-620a	Taxiway Painting	1,500	SF	\$	\$
19	P-620b	Reflective Media, Type III	130	LB	\$	\$
20	P-620c	Marking Removal	700	SF	\$	\$
21	D-705a	6 Inch Pipe Underdrain	680	LF	\$	\$
22	T-901	Seeding	3	AC	\$	\$
23	L-108a	Trenching for Direct-buried Cable	Incidental		Incidental	
24	L-108b	No. 8 AWG L-824C Cable, Installed in Trench	Incidental		Incidental	
25	L-108c	No. 8 AWG L-824C Cable, Installed in Duct Bank or Conduit	220	LF	\$	\$
26	L-108d	Bare Counterpoise Wire, Installed in Trench, including ground rods and ground connectors	110	LF	\$	\$
27	L-110a	Concrete Encased Electrical Duct Bank (2 way, 4 Inch)	110	LF	\$	\$
28	L-125a	Splice Base	2	EA	\$	\$
TOTAL BID AMOUNT – SCHEDULE I					\$	
* Depending on bid prices, Bid Alternate I item may be selected to replace Items 11 & 12 in Schedule I						

SCHEDULE I –BID ALTRERNATE I						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
*11/12	P-304	Cement-treated Base Course (4 Inches Thick)	3,555	SY	\$	\$
* Depending on bid prices, Bid Alternate I item may be selected to replace Items 11 & 12 in Schedule I						

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE II – RECONSTRUCT TAXIWAY F						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
1	S-2a	Remove and Salvage Asphalt Mat (Rotomill Full Depth)	2,100	SY	\$	\$
2	S-2b	Remove Concrete Encased Duct Bank	1	EA	\$	\$
3	S-2c	Remove Retroreflective Edge Markers	10	LS	\$	\$
4	S-2d	Remove Taxiway Edge Light	1	EA	\$	\$
5	S-3a	Relocate Sign	2	EA	\$	\$
6	S-6	Watering	Incidental		Incidental	
7	P-151	Clearing and Grubbing	Incidental		Incidental	
8	P-152a	Unclassified Excavation	3,100	CY	\$	\$
9	P-152b	Shoulder Grading	1,400	SY	\$	\$
10	P-154	Subbase Course (18 Inches Thick)	3,850	SY	\$	\$
11	P-156	Temporary Air and Water Pollution, Soil Erosion and Siltation Control	Incidental		Incidental	
*12	P-401a	Bituminous Base Course (4 Inches Thick)	910	TON	\$	\$
*13	P-401b	Bituminous Material (PG 70-22) (Base)	64	TON	\$	\$
14	P-401c	Bituminous Surface Course (4 Inches Thick)	870	TON	\$	\$
15	P-401d	Bituminous Material (PG 70-22)	61	TON	\$	\$
16	P-602	Bituminous Prime Coat	5	TON	\$	\$
17	P-603	Bituminous Tack Coat	Incidental		Incidental	
18	P-610	Structural Portland Cement Concrete	Incidental		Incidental	

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE II CONTINUED – RECONSTRUCT TAXIWAY F						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
19	P-620a	Taxiway Painting	2,060	SF	\$	\$
20	P-620b	Reflective Media, Type III	180	LB	\$	\$
21	D-705a	6 Inch Pipe Underdrain	1,325	LF	\$	\$
22	D-705b	6 Inch Storm Sewer PVC Pipe	120	LF	\$	\$
23	T-901	Seeding	2	AC	\$	\$
24	L-108a	Trenching for Direct-buried Cable	Incidental		Incidental	
25	L-108b	No. 8 AWG L-824C Cable, Installed in Duct Bank or Conduit	Incidental		Incidental	
26	L-108c	No. 8 AWG L-824C Cable, Installed in Duct Bank or Conduit	1,600	LF	\$	\$
27	L-108d	Bare Counterpoise Wire, Installed in Trench, including ground rods and ground connectors	690	LF	\$	\$
28	L-110a	Concrete Encased Electrical Duct Bank (2 way, 4 Inch)	110	LF	\$	\$
29	L-110b	Electrical Conduit (DEB) (2 Inch)	580	LF	\$	\$
30	L-125a	Splice Base	7	EA	\$	\$
31	L-125b	Retroreflective Edge Marker	23	EA	\$	\$
TOTAL BID AMOUNT – SCHEDULE II					\$	
* Depending on bid prices, Bid Alternate I item may be selected to replace Items 12 & 13 in Schedule II						

SCHEDULE II – BID ALTERNATE I

Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
*12/13	P-304	Cement-treated Base Course (4 Inches Thick)	3,850	SY	\$	\$
* Depending on bid prices, Bid Alternate I item may be selected to replace Items 12 & 13 in Schedule II						

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE III – RECONSTRUCT TAXIWAY G						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
1	S-2a	Remove and Salvage Asphalt Mat (Rotomill Full Depth)	7,905	SY	\$	\$
2	S-3b	Adjust Height of Taxiway Edge Lights	1	LS	\$	\$
3	S-6	Watering	Incidental		Incidental	
4	S-601	Crack sealing	5	TON	\$	\$
5	P-151	Clearing and Grubbing	Incidental		Incidental	
6	P-152a	Unclassified Excavation	6,030	CY	\$	\$
7	P-152b	Shoulder Grading	2,920	SY	\$	\$
8	P-154	Subbase Course (18 Inches Thick)	7,910	SY	\$	\$
9	P-156	Temporary Air and Water Pollution, Soil Erosion and Siltation Control	Incidental		Incidental	
*10	P-401a	Bituminous Base Course (4 Inches Thick)	1,868	TON	\$	\$
*11	P-401b	Bituminous Material (PG 70-22) (Base)	131	TON	\$	\$
12	P-401c	Bituminous Surface Course (4 Inches Thick)	1,868	TON	\$	\$
13	P-401d	Bituminous Material (PG 70-22)	131	TON	\$	\$
14	P-602	Bituminous Prime Coat	10	TON	\$	\$
15	P-603	Bituminous Tack Coat	Incidental		Incidental	
*16	P-608	Emulsified Asphalt Seal Coat	6,280	SY	\$	\$

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE III – RECONSTRUCT TAXIWAY G							
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing		Total Price
17	P-610	Structural Portland Cement Concrete	Incidental		Incidental		
18	P-620a	Taxiway Painting	3,400	SF	\$	\$	
19	P-620b	Reflective Media, Type III	300	LB	\$	\$	
20	P-620c	Marking Removal	2,762	SF	\$	\$	
21	L-108a	Trenching for Direct-buried Cable	Incidental		Incidental		
22	L-108b	No. 8 AWG L-824C Cable, Installed in Trench	Incidental		Incidental		
TOTAL BID AMOUNT – SCHEDULE III					\$		
*Depending on bid prices, Bid Alternate items may be selected to replace Items 10, 11 and/or 16 in Schedule III.							

SCHEDULE III - BID ALTERNATE I						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
*10/11	P-304	Cement-treated Base Course (4 Inches Thick)	7,910	SY	\$	\$
*Depending on bid prices, Bid Alternate I item may be selected to replace Items 10 and 11 in Schedule III.						

SCHEDULE III - BID ALTERNATE II						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
*16	P-629	Thermoplastic Coal Tar Emulsion Spray Seal Coat with Sand Aggregate	6,280	SY	\$	\$
*Depending on bid prices, Bid Alternate II item may be selected to replace Item 16 in Schedule III.						

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE IV – RECONSTRUCT TAXIWAY E						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
1	S-2a	Remove and Salvage Asphalt Mat (Rotomill Full Depth)	5,290	SY	\$	\$
2	S-2b	Remove Concrete Encased Duct Bank	2	EA	\$	\$
3	S-3b	Adjust Height of Taxiway Edge Lights	1	LS	\$	\$
4	S-6	Watering	Incidental		Incidental	
5	P-151	Clearing and Grubbing	Incidental		Incidental	
6	P-152a	Unclassified Excavation	4,045	CY	\$	\$
7	P-152b	Shoulder Grading	1,220	SY	\$	\$
8	P-154	Subbase Course (18 Inches Thick)	5,415	SY	\$	\$
9	P-156	Temporary Air and Water Pollution, Soil Erosion and Siltation Control	Incidental		Incidental	
*10	P-401a	Bituminous Base Course (4 Inches Thick)	1,280	TON	\$	\$
*11	P-401b	Bituminous Material (PG 70-22) (Base)	90	TON	\$	\$
12	P-401c	Bituminous Surface Course (4 Inches Thick)	1,250	TON	\$	\$
13	P-401d	Bituminous Material (PG 70-22)	87	TON	\$	\$
14	P-602	Bituminous Prime Coat	7	TON	\$	\$
15	P-603	Bituminous Tack Coat	Incidental		Incidental	
16	P-610	Structural Portland Cement Concrete	Incidental		Incidental	

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SCHEDULE IV CONTINUED - RECONSTRUCT TAXIWAY E						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
17	P-620a	Taxiway Painting	3,080	SF	\$	\$
18	P-620b	Reflective Media, Type III	270	LB	\$	\$
19	P-620c	Marking Removal	540	SF	\$	\$
20	D-705a	6 Inch Pipe Underdrain	1,045	LF	\$	\$
21	D-705b	6 Inch Storm Sewer PVC Pipe	165	LF	\$	\$
22	T-901	Seeding	1	ACRE	\$	\$
23	L-108a	Trenching for Direct-buried Cable	Incidental		Incidental	
24	L-108b	No. 8 AWG L-824C Cable, Installed in Trench	Incidental		Incidental	
25	L-108c	No. 8 AWG L-824C Cable, Installed in Duct Bank or Conduit	420	LF	\$	\$
26	L-108d	Bare Counterpoise Wire, Installed in Trench, including ground rods and ground connectors	210	LF	\$	\$
27	L-110a	Concrete Encased Electrical Duct Bank (2 way, 4 Inch)	210	LF	\$	\$
28	L-125a	Splice Base	4	EA	\$	\$
TOTAL BID AMOUNT – SCHEDULE IV					\$	
*Depending on bid prices, Bid Alternate item may be selected to replace Items 10 and 11 in Schedule IV.						

SCHEDULE IV - BID ALTERNATE I						
Item No.	Spec. No.	Description	Est. Qty.	Unit	Unit Price in Figures/Writing	Total Price
*10/11	P-304	Cement-Treated Base Course (4 Inches Thick)	5,415	SY	\$	\$
*Depending on bid prices, Bid Alternate item may be selected to replace Items 10 and 11 in Schedule IV.						

CITY OF FARMINGTON, NEW MEXICO

BID PROPOSAL, FORM AF-3

SUMMARY	
Total Bid Amount - Schedule I	\$
Total Bid Amount - Schedule II	\$
Total Bid Amount - Schedule III	\$
Total Bid Amount - Schedule IV	\$
TOTAL OF SCHEDULES	\$

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CITY OF FARMINGTON, NEW MEXICO

BIDDER'S ESTIMATE OF TAXES, FORM AF-4

The City of Farmington issues **Type 9 Non-Taxable Transaction Certificates** (NTTC's) and is tax exempt for purchases of TANGIBLE PERSONAL PROPERTY ONLY. These certificates may not be used to purchase construction materials to be used in construction projects. To receive an NTTC please contact Accounts Payable at 505-599-1213. Determinations for applicable tax classification should be made by the Taxation and Revenue Department or your tax consultant. Please call 505-325-5049 for the Farmington branch or 505-827-0700 for the State office.

I, the official signature on the Bid Submittal Form (AF-1a), hereby swear that I am duly authorized to legally bind the prospective contractor to this estimate of taxes certification. Hereby as Bidder, I certify that Bidder has made a diligent effort to ascertain and identify all taxes which will be charged to the City against this Bid and that, in Bidder's opinion, the taxes identified below and the amount shown for all of the taxes which will be charged in addition to the bid total shown on the Bid Proposal Form AF-3. I affirm Bidder will submit payment on the State of New Mexico periodic CRS-1 report for actual taxes due, as estimated below, to the State of New Mexico Taxation and Revenue Department, accurately identifying the appropriate governmental entity to receive credit for taxes paid.

I am fully aware that this certification is made under penalty of perjury under the laws of the State of New Mexico.

New Mexico Gross Receipts Tax	_____ %	\$ _____	Bidder's Initial Below to Certify Compliance _____
Compensating Tax	_____ %	\$ _____	
Other	_____ %	\$ _____	

Contractor's New Mexico CRS
Identification
Number _____

17-119587

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CITY OF FARMINGTON, NEW MEXICO

CONTRACTOR'S LIST OF SUBCONTRACTORS, FORM AF-5

Subcontractor's listing threshold \$20,000 for Bid #17-119587

As required in the Bid Documents, Tab I titled "Bidding Requirements," page BR-2, paragraph 8 titled "Subcontractors and Manufacturers." Bidder shall submit the following information pursuant to Section 13-4-31 through 13-4-43 NMSA 1978, with emphasis added for completion of this form.

The shaded areas below are required to be completed at time of bid opening. If not completed, the bid will be considered non-responsive and rejected. Information in the non-shaded areas may be requested from the bidder after the bid opening if not provided.

Category of Work	Subcontractor's Name	City or County of Subcontractor	Amount	Public Works Registration # (if over \$60,000)	Subcontractor's License #

In compliance with Public Works Section 13-4-36 C & D NMSA 1978, Substitution of Subcontractor.

- C. No contractor whose bid is accepted shall permit any subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid without the consent of the using agency.
- D. No contractor whose bid is accepted, other than in the performance of change orders causing changes or deviations from the original contract, shall sublet or subcontract any portion of the work in excess of the listing threshold as to which his original bid did not designate a subcontractor unless:
- (1) the contractor fails to receive a bid from a category of work. Under such circumstances, the contractor may subcontract. The contractor shall designate on the listing form that **no bid was received** or;
 - (2) the contractor fails to receive more than one bid for a category of work. Under such circumstances, the contractor may subcontract. The contractor shall state on the listing form that **only one subcontractor's bid was received**, together with the name of the subcontractor. This designation shall not occur more than one time on the subcontractor list.

In compliance with Public Works Section 13-4-13.1 NMSA 1978, Public Works Contracts, Registration of Contractors and Subcontractors. Contractors submitting bid pricing more than \$60,000 shall be registered with the New Mexico Department of Workforce Solutions prior to submitting a bid to the City of Farmington. If a Contractor is not registered at the time of Bid opening, their Bid shall be considered non-responsive and will be rejected. Contractor's subcontractors shall also be registered. If a Contractor's Bid includes any subcontractor that is not registered, their Bid may be considered for award following substitution of a registered subcontractor for any unregistered subcontractor in accordance with Section 13-4-36 NMSA 1978. Bidders may find additional information on the registration requirements and forms at the following website: <http://www.dws.state.nm.us/dws-pubwage.html>

In compliance with Public Works Section 13-4-37 A NMSA 1978, it is the responsibility of each subcontractor submitting a bid to a contractor to be prepared to submit a faithful performance and payment bond if so requested by the contractor.

In compliance with Procurement Section 13-1-148.1 NMSA 1978, a subcontractor shall provide a performance and payment bond on a public works building project if the subcontractor's contract for work to be performed on a project is one hundred twenty-five thousand dollars (\$125,000) or more.

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CITY OF FARMINGTON, NEW MEXICO

BID BOND, FORM AF-6

Project: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport

Project #: AIP 3-35-0016-039-2016

Bid #: 17-119587

Bond # _____

KNOW ALL MEN BY THESE PRESENTS:

That we _____ hereinafter called the Principal, as Principal, and the _____ of _____, a corporation duly organized under the laws of the State of _____ hereinafter called Surety, as Surety, are held and firmly bound unto the City of Farmington, hereinafter called the Obligee, in the sum of _____ dollars, for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for:

The work to be performed under this contract shall consist of furnishing all labor, equipment, and materials Taxiway E, F, and G will be reconstructed to include pavement removal, excavation, subbase course, base course, asphalt paving, electrical, and pavement marking..

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into an Agreement with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Agreement and for the prompt payment of labor and material furnished in the prosecution thereof or in the event that either the Obligee shall be unable to accept the bid of the Principal as a result of acts or omissions of the principal or the failure of the Principal to enter such Agreement and give such bond or bonds, if the Principal shall pay to the Obligee the difference, not to exceed the amount hereof, between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

SIGNED AND SEALED this _____ day of _____, 2017.

WITNESS

Principal

By: _____

Title: _____

Street Address

Mailing Address

City, State and Zip Code

Phone Number

SURETY

BY _____

WITNESS

STREET ADDRESS

MAILING ADDRESS

CITY/STATE AND ZIP CODE

PHONE NUMBER

CERTIFICATE OF SURETY ON BID BOND

_____, Surety on the Bid Bond dated the ____ day of _____, 2017, wherein _____ is Principal and the City of Farmington as Obligee does hereby rectify that Surety is duly authorized to transact business as a corporate surety in New Mexico, that as Surety it has complied with all applicable laws of the State of New Mexico.

Witness, my hand and seal this _____ day of _____, 2017.

Surety

By _____

Title _____

THIS BOND MUST BE ACCOMPANIED BY POWER OF ATTORNEY, EFFECTIVELY DATED

CITY OF FARMINGTON, NEW MEXICO

STATEMENT OF BIDDER'S QUALIFICATIONS, FORM AF-8

PART I - This section of the statement of bidder's qualifications must be submitted to the Owner with the Bidder's bid documents. Bidder shall submit answers to questions 1 through 8 and provide all requested information, where applicable. Any prospective bidder failing to do so may be deemed to be not responsive and not responsible with respect to this statement of qualification at the sole discretion of the Owner.

All questions must be answered. A response of "Not Applicable (N/A)", or the equivalent, is not acceptable. Answers must be typewritten or printed in ink. The data given must be clear and comprehensive. This statement must be notarized. If necessary, questions are to be answered on separate attached sheets and identify the corresponding question number(s) the answers apply to. The Bidder may submit any additional information he desires.

PART I CERTIFICATION

The undersigned hereby authorizes any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this statement of Bidder's Qualifications.

BEING DULY SWORN AND DEPOSED, I HEREBY CERTIFY UNDER PENALTY OF PERJURY, THAT THE INFORMATION PROVIDED HEREIN IS ACCURATE, TRUE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Print Name: _____

Title: _____

Signature: _____

Date: _____/_____/_____

Notary Seal

Notary Public: _____

My commission expires: _____

Name of Bidder _____

Permanent main office address _____

When organized _____ If a corporation, where incorporated _____

If a corporation, can you obtain a certification of Good Standing and Comparison from the State Corporation Commission? **Yes** ☐ **No** ☐ If No, provide the reason(s) this cannot be provided at this time.

How many years have you been engaged in the contracting business under your present firm or trade name: _____

Does the submitting bidder now use, or has it in the past **five** years used, another business name or abbreviation other than the submitting bidder's name listed on this questionnaire? **Yes** ☐ **No** ☐ If Yes, provide the other business name(s) or abbreviation(s).

License

1. Does your firm hold the appropriate N.M. Contractors License Number for this contract? **Yes** ☐ **No** ☐ Is the license current and in good standing with the State of New Mexico Construction Industries Division (CID)? **Yes** ☐ **No** ☐ If yes, provide the following information.

a. Name of license holder exactly as on file with the State of New Mexico CID: _____

b. License classification(s): _____ c. License number: _____

c. Issue date: _____ d. Expiration date: _____

d. List Qualified Party(s): _____

2. Is your firm's contractor's license **free** of being, or ever having been, suspended or revoked by the CID or by the appropriate licensing agency in any other state? **Yes** ☐ **No** ☐ If No, list the date and reason(s) for the suspension(s) or revocation(s).

3. Does your firm hold a current N.M. Dept. of Labor Registration Number? **Yes** ☐ **No** ☐ If Yes, provide this number _____

CITY OF FARMINGTON, NEW MEXICO

STATEMENT OF BIDDER'S QUALIFICATIONS, FORM AF-8

Construction and Past Contracting Experience - Complete or provide information related to the following:

2. List the background and experience of the principal members of your organization, including the officers.
3. Identify your firm's current contracts. (Schedule these, showing the anticipated dates of completion.)
4. Summarize the general character of work performed by your company.
5. List the projects recently completed by your company during the past **five** years, stating the approximate cost of each, the month and year commenced and the month and year completed.
6. List your experience in construction work similar to this project.

PART II - Questions 9 through 31 will only be required to be submitted by the apparent low bidder and only upon specific request by the Owner in writing. Questions in this section requiring further explanation shall be answered on a separate attached sheet and the explanation identifying the corresponding question number. Answers to the questions below marked by the Bidder as confidential will be handled as confidential information only to the extent allowed by law.

Claims History

9. Has your firm, during the past **five** years, been a judgment debtor on any garnishment suits filed by any Supplier or Subcontractor? **Yes** ☐ **No** ☐ If yes the following information must be provided: (a) Identify any suits filed for debt or money due that remains outstanding; (b) Name of Supplier or Subcontractor issuing garnishment; (d) Amount of garnishment; (e) Date garnishment filed; (f) Has garnishment been satisfied or remains open.
10. Has your firm, during the past **five** years, been subject to of any tax levy claim(s) filed by any Federal, State, County or local government entity? **Yes** ☐ **No** ☐ If yes the following information must be provided: (a) Agency filing tax levy claim; (b) Date of claim; (c) Summary of Claim; (d) Status of Claim (e) Amount of Levy.
11. Has your firm, during the past **five** years, been formally debarred from performing public works projects in the State of New Mexico or any other jurisdiction? **Yes** ☐ **No** ☐ If yes list the date and reason(s) for the debarment and State issuing the debarment.
12. Has your firm, during the past **five** years, been determined by a court or an administrative agency to have repeatedly or willfully violated laws and/or regulations pertaining to the payment of prevailing wages or employment of apprentices of public works projects in the State of New Mexico or any other jurisdiction? **Yes** ☐ **No** ☐ If yes, the following information must be provided: (a) Violation of law or regulation; (b) Issuing jurisdiction; (c) Date of action.
13. Has your firm, during the past **five** years, ever failed to complete any work awarded to you? **Yes** ☐ **No** ☐ If yes, the following information must be provided: (a) Project Name; (b) Project location; (c) Owner/Corporate name, contact name and phone number.
14. Has your firm, during the past **five** years, ever defaulted on a contract? **Yes** ☐ **No** ☐ If yes, the same information required in above question 13 must be provided.
15. In the past **five** years has your firm been assessed liquidated damages on a contract? **Yes** ☐ **No** ☐ If yes, the following information must be provided: (a) Number of days liquidated damages were assessed; (b) Amount of liquidated damages assessed; (c) Project name; (d) Project location; (e) Owner/Corporate name, contact name and phone number.

CITY OF FARMINGTON, NEW MEXICO

STATEMENT OF BIDDER'S QUALIFICATIONS, FORM AF-8

Financial Data:

16. Credit available: \$ _____
17. Give bank reference: _____
18. Provide financial statements for the past **three** years that have been independently audited or reviewed by a certified public accountant or accounting firm. Is net profit positive for the previous two years? **Yes** ☐ **No** ☐ Do the financial statements represent Bidder is financially solvent, able to pay debts, and have sufficient working capital to complete the Work? **Yes** ☐ **No** ☐
Bidder may be required to furnish other financial information that may be requested by the Owner.

Surety

19. Provide the following information on **all** surety companies utilized during the past **five** years.
20. Surety name: _____ Surety telephone number: _____
21. Period covered by surety: _____
22. Maximum amount of bonding capacity provided by surety: \$ _____
23. In the past **five** years has your firm ever defaulted on a contract resulting in take over by a surety for completion? **Yes** ☐ **No** ☐
If yes provide the (a) Project Name; (b) Project location; (c) Owner/Corporate name, contact name and phone number; and (d) the Surety name.

Safety

24. Is your workers' compensation Experience Modification Rate (EMR) less than 1.0 for each of the past **five** years?
Yes ☐ **No** ☐ If yes, provide verification from your worker's compensation carrier.
25. Does your firm have a written safety program compliant with the Owner's contract requirements? **Yes** ☐ **No** ☐
If yes, is one copy available upon request in electronic format? **Yes** ☐ **No** ☐
26. In the past **five** years has your firm been issued any safety citations against any major equipment performing work on a jobsite? **Yes** ☐ **No** ☐ If yes, list the date, reason for the citation, and government agency issuing the citation.
27. Provide your firm's New Mexico Department of Transportation number: _____

Key Personnel

28. Attach a resume for each of the following persons identified. The resume shall identify other similar project(s) over the past **five** years in which this person had a similar role.
29. Does your Project Manager have at least **five** years experience in the construction industry? **Yes** ☐ **No** ☐
Name: _____ Years employed by your firm: _____
30. Does the lead Superintendent have at least **five** years experience as a Superintendent in the construction industry?
Yes ☐ **No** ☐ Name: _____ Years employed by your firm: _____
31. Does the designated lead safety program manager have at least **five** years experience in the construction safety profession?
Yes ☐ **No** ☐ Name: _____ Years employed by your firm: _____

Contractor's Comments

Use an attached sheet to provide further explanation any of the answers to questions asked in this Qualification Statement. Each explanation or comment must identify the corresponding question number.

PART II CERTIFICATION

The undersigned hereby authorizes any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this statement of Bidder's Qualifications.

BEING DULY SWORN AND DEPOSED, I HEREBY CERTIFY UNDER PENALTY OF PERJURY, THAT THE INFORMATION PROVIDED HEREIN IS ACCURATE, TRUE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Print Name: _____ Title: _____

Signature: _____ Date: _____/_____/_____

Notary Seal

Notary Public: _____ My commission expires: _____

CITY OF FARMINGTON, NEW MEXICO

DRUG-FREE WORKPLACE CERTIFICATION, FORM AF-25

Project Name: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport
Project #: AIP 3-35-0016-039-2016
Bid #: 17-119587

The Contractor named below hereby certifies to be in compliance with 49 CFR parts 40 and 382 by establishing a program designed to help prevent accidents and injuries resulting from the misuse of alcohol or use of controlled substances by drivers of commercial motor vehicles and to provide a workplace free of drug use and alcohol misuse. The below Contractor will:

1. Have in place a policy in compliance with 49 CFR Parts 40 and 382 that provides for pre-employment, post-accident, random, reasonable suspicion, return-to-duty, and follow -up testing for controlled substances and alcohol.
2. 49 CFR Part 382, section 382.603 requires that persons designated to supervise drivers receive at least 60 minutes of training on alcohol misuse and receive an additional 60 minutes of training on controlled substances use.
3. Have in place a drug free and alcohol free workplace policy that applies to everyone that works on the project described in the contract. The drug free and alcohol free workplace policy shall include an education and training program that informs employees about the following:
 - a. The dangers of drug use and alcohol misuse in the workplace;
 - b. The person's or organization's policy in maintaining a workplace free of drug use and alcohol misuse;
 - c. Any available counseling, rehabilitation and employee assistance programs;
 - d. Penalties that may be imposed upon employees for violations; and,
 - e. Provisions for pre-employment and reasonable suspicion testing.
4. All of the contractor's employees who perform work on this project must be provided with a copy of the above referenced policies as those policies apply to them, i.e. not all employees are commercial drivers, but all employees would be subject to the drug-free and alcohol-free workplace policies.
5. That everyone who works on the contract agrees to abide by the terms of the Contractor's Statement as a condition of continued employment on the contract.
6. That no one who has tested positive within the past year will be allowed to perform work on this project.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of New Mexico.

OFFICIAL'S NAME	COMPANY NAME
DATE EXECUTED	EXECUTED IN THE COUNTY OF
CONTRACTOR'S SIGNATURE	
TITLE	
FEDERAL ID NUMBER	

CITY OF FARMINGTON, NEW MEXICO

CONTRACTOR SAFETY CERTIFICATION, FORM AF-26

Project Name: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport
Project #: AIP 3-35-0016-039-2016
Bid #: 17-119587

The Contractor named below hereby certifies and shall comply with all applicable Federal, State, County laws, rules, regulations, City ordinances, and best safety practice guidelines for the health and safety of contractor and sub-contractor employees when performing work for the City of Farmington. The City of Farmington Compliance Contractor Safety Verification Program shall require contractors and subcontractors to comply with the law, and use all safety precautions to protect their employees, and the public when engaged in construction projects. The personal safety and health of contractor's and subcontractor's employees is of primary importance. The prevention of occupationally induced injuries and illnesses is of such consequence that it shall be given precedence over operating productivity whenever necessary.

Regulatory Standards: All applicable federal, state and local safety, health and environmental regulatory requirements, including but not limited to: OSHA -29 CFR.

BASIS: It is the responsibility of the general contractor to ensure contractor, and sub-contractors working within the City of Farmington adhere to all applicable safety, health, and environmental standards while conducting business on the construction site or on City Property. When a general contractor arranges to have employees of another employer (sub-contractors) perform work that involves activities that may put personnel at risk, the general contractor will inform the sub-contractor that the workplace contains specific hazards and that the work to be done shall be allowed only if all workers have the proper training, necessary certification(s), proper equipment, and work conditions to complete the work safely.

GENERAL: The contractor will ensure that safe work practices are used by contractor and sub-contractor personnel to provide for the control of risks associated with hazards, by using established procedures for; lock-out-tag-out, confined space entry, welding, trenching, piping, PPE, fall protection, dust control, hearing protection, public safety, and general safety. At the request of the City's Safety Division, the contractor shall provide information regarding the contractor's past safety performance and current safety program.

Responsibility: The contractor shall be responsible for complying with the safety standards applicable to the work they are performing. The contractor agrees that he/she is responsible to enforce compliance with all safety regulations from everyone, including sub-contractors, who work on the contract as a condition of employment on the contract.

Contractor Safety Inspections: Contractor work site safety inspections may be conducted periodically by a City of Farmington Safety Inspector.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of New Mexico.

OFFICIAL'S NAME	COMPANY NAME
DATE EXECUTED	EXECUTED IN THE COUNTY OF
CONTRACTOR'S SIGNATURE	
TITLE	
FEDERAL ID NUMBER	

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NEW MEXICO STATE
WAGE RATES

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STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

PUBLIC WORKS PROJECT REQUIREMENTS

As a participant in a Public Works project valued at more than \$60,000 in the State of New Mexico, the following list addresses many of the responsibilities that are defined by statute or regulation to each project stakeholder.

Contracting Agency

- Ensure that all Contractors wishing to bid on a Public Works project when the project is \$60,000 or more are actively registered with the Public Works and Apprenticeship Application (PWAA) website: <http://www.dws.state.nm.us/pwaa> (Contractor Registration) prior to bidding.
- Please submit Notice of Award (NOA) and Subcontractor List(s) to the PWAA website promptly after the project is awarded.
- Please update the Subcontractor List(s) on the PWAA website whenever changes occur.

General Contractor

- Provide a complete Subcontractor List and Statements of Intent (SOI) to Pay Prevailing Wages for each Contractor to the Contracting Agency within 3 (three) days of award.
- Ensure that all Subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: <http://www.dws.state.nm.us/pwaa> prior to bidding when their bid will exceed \$60,000.
- Submit bi-weekly certified payrolls to the Contracting Agency.
- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.
- Confirm the Wage Rate poster, provided in PWAA, is displayed at the job site in an easily accessible place.
- Make sure, when a project has been completed, the Affidavits of Wages Paid (AWP) are sent to the Contracting Agency.

Subcontractor

- Ensure that all Subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: <http://www.dws.state.nm.us/pwaa> prior to bidding when their bid will exceed \$60,000.
- Submit bi-weekly certified payrolls to the General Contractor(s).



STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.

Additional Information

Reference material and forms may be found at New Mexico Department of Workforce Solutions Public Works web pages at: http://www.dws.state.nm.us/new/Labor_Relations/publicworks.html.

CONTACT INFORMATION

Contact the Labor Relations Division for any questions relating to Public Works projects by email at public.works@state.nm.us or call (505) 841-4400.

TYPE "A" - STREET, HIGHWAY, UTILITY & LIGHT ENGINEERING

Effective January 1, 2017

Trade Classification	Base Rate	Fringe Rate On and Prior to February 10, 2017	Fringe Rate After February 10, 2017
Bricklayer/Blocklayer/Stonemason	23.46	8.40	8.40
Carpenter/Lather	23.75	9.27	9.27
Cement Mason	17.42	6.35	6.35
Ironworker	26.50	14.32	14.32
Painter (Brush/Roller/Spray)	16.60	5.78	5.78
Plumber/Pipefitter	22.84	7.48	7.48
Electricians (outside)			
Groundman	21.81	10.92	10.92
Equipment Operator	31.31	13.39	13.39
Lineman/Wireman or Tech	36.83	14.82	14.82
Cable Splicer	40.51	15.38	15.38
Laborers			
Group I	12.20	5.30	5.30
Group II	12.50	5.30	5.30
Group III	12.90	5.30	5.30
Operators			
Group I	16.69	6.03	6.33
Group II	17.44	6.03	6.33
Group III	17.55	6.03	6.33
Group IV	17.63	6.03	6.33
Group V	17.75	6.03	6.33
Group VI	17.89	6.03	6.33
Group VII	18.27	6.03	6.33
Group VIII	18.50	6.03	6.33
Group IX	25.45	6.03	6.33
Group X	28.35	6.03	6.33
Truck Drivers			
Group I	16.00	7.02	7.02
Group II	16.00	7.02	7.02
Group III	16.00	7.02	7.02
Group IV	16.00	7.02	7.02

NOTE: SUBSISTENCE, ZONE AND INCENTIVE PAY APPLY ACCORDING TO THE PARTICULAR TRADES COLLECTIVE BARGAINING AGREEMENT. DETAILS ARE LOCATED AT WWW.DWS.STATE.NM.US.



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Wage Decision Approval Summary

1) Project Title: Taxiway E, F, and G Reconstruction
Requested Date: 05/01/2017
Approved Date: 05/02/2017
Approved Wage Decision Number: SJ-17-0731-A

Wage Decision Expiration Date for Bids: 08/30/2017

2) Physical Location of Jobsite for Project:
Job Site Address: 1300 Navajo St.
Job Site City: Farmington
Job Site County: San Juan

3) Contracting Agency Name (Department or Bureau): City of Farmington
Contracting Agency Contact's Name: Jennifer Rowland
Contracting Agency Contact's Phone: (505) 599-1386 Ext.

4) Estimated Contract Award Date: 07/01/2007

5) Estimated total project cost: \$4,000,000.00
a. Are any federal funds involved?: Yes - \$3,894,000.00
b. Does this project involve a building?: No
c. Is this part of a larger plan for construction on or appurtenant to the property that is subject to this project?: No
d. Are there any other Public Works Wage Decisions related to this project?: No
e. What is the ultimate purpose or functional use of the construction once it is completed?: To reconstruct the asphalt pavement for Taxiway E, F, and G.

6) Classifications of Construction:

Classification Type and Cost Total	Description
Highway/Utilities (A) Cost: \$4,000,000.00	Pavement reconstruction including pavement removal, excavation, base course, asphalt paving, electrical, and marking.

TAB I

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1. INSTRUCTIONS TO BIDDERS

1.1 The City of Farmington, New Mexico, ("OWNER") is requesting Bids for the construction as announced in the Invitation to Bid (Form AF-1(a)). Unless otherwise stated in the Contract Documents, Engineering for this project along with Contract Documents were completed by the City of Farmington, Municipal Annex Building, 805 Municipal Drive, Farmington, New Mexico.

2. DOCUMENTS

2.1 The Contract Documents may be examined and obtained as announced in the Advertisement for Bids (Form AF-2).

2.2 The Contract Documents contain the provisions required for the construction of the Project. Information obtained from an officer, agent, employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the Contract.

2.3 Documents shall include the following standard specifications unless otherwise stated:

2.3.1 New Mexico Standard Specifications for Public Works Construction, latest edition;

and

2.3.2 City of Farmington Technical Specifications and Construction Standards, latest revision.

3. QUESTIONS

3.1 Submit all questions about the drawings or specifications to the OWNER in writing no later than five (5) working days prior to the time set for receipt of bids. Corrections or clarifications shall be made by addendum. Oral clarifications will not be binding.

4. PREPARATION OF BIDS

4.1 Bids shall be submitted on the forms provided.

4.2 Bid forms must be completed in ink. The grand total of the Contract must be stated on the Bid Proposal Form (Form AF-3) in both writing and numerals; in case of an error, the price in words, unless obviously incorrect, shall govern. The completed forms shall be without interlineations, alteration or erasure.

4.3 Bids shall not contain any recapitulations of the work to be done. Alternate proposals will not be considered unless called for.

4.4 Bids by a corporation must be executed in the corporate name by the president or vice-president (or

other corporate officer accompanied by evidence of authority to sign). The corporate address and state of incorporation shall be shown on the Invitation to Bid.

4.5 Bids by partnership must be executed in the partnership name and signed by a general partner. The partner's title must appear next to the signature and the official address of the partnership must be shown on the Invitation to Bid.

4.6 All names must be printed above the signature on the Invitation to Bid.

4.7 The CONTRACTOR shall be licensed under the proper classification(s) as outlined under the State of New Mexico's Construction Industries Division Rules and Regulations (latest edition). A CONTRACTOR not having the minimum license at the time of Bid opening shall be considered a non-responsive Bidder and their Bid will be rejected.

4.8 Each addendum shall be made a part of the Contract Documents to the same extent as though contained in the original documents and itemized listings thereof. Each Bidder shall acknowledge receipt of each addendum in the space provided on the Invitation to Bid.

4.9 Pursuant to Section 13-1-108 NMSA 1978, the total amount Bid shall exclude all applicable taxes including applicable state gross receipts tax or applicable local option tax. The OWNER will pay for any taxes due on the Contract and will pay any increase in applicable taxes which become effective after the date the Contract is entered into in addition to the Bid total based upon separate billings which the successful Bidder shall submit with each request for payment. Taxes shall be shown as a separate amount on such billing or request for payment and shall separately identify each tax being billed.

4.10 To assist the OWNER with budget preparation, the Bidder shall complete Bidder's Estimate of Taxes (Form AF-4), and shall identify by name each tax Bidder believed to be applicable to this Contract and shall estimate the amount of each tax which will be charged on the entire Contract.

5. SUBMISSION OF BIDS

5.1 Bids shall be submitted at the time and place indicated in the Invitation to Bid. Bids shall be submitted in a sealed opaque envelope, addressed to the OWNER, and plainly marked on the outside with the project title, bid number, and opening. If forwarded by mail, the sealed envelope containing the Bid may be enclosed in another envelope addressed to the OWNER at the address stated in the Advertisement for Bids. The City of Farmington reserves the right to accept or reject any or all Bids.

6. RESIDENT CONTRACTOR PREFERENCE

~~6.1 Per Senate Bill 1, signed by Governor Martinez on October 5, 2011, all resident contractors, wishing to obtain in-state preference, are required to obtain a preference number with the New Mexico Department of Taxation and Revenue. All preference numbers issued prior to January 1, 2012 are invalid. It will be the sole responsibility of the Bidders requesting consideration for Resident Preference to obtain approval and a certification from the New Mexico Department of Taxation and Revenue prior to the bid opening date.~~

~~6.2 In accordance with Sections 13-1-21 and 13-1-22 NMSA 1978 and effective July 1, 2012, a resident veteran's business preference has been implemented. The Taxation and Revenue Department (TRD) will be issuing a three (3) year certificate to each qualified business. Businesses are required to reapply to TRD every three (3) years with the proper documentation to renew their certificate.~~

~~6.3 This preference is separate from the in-state preference and is not cumulative with that preference.~~

7. BID SECURITY

7.1 Each Bid must be accompanied by a Proposal Guarantee (Form AF-6) payable to the OWNER for the amount stipulated in the Invitation to Bid which shall be certified check, cashier's check, money order, or Bidders' Surety Bond executed by a bona fide Surety Company authorized to transact business in the State of New Mexico on the form provided in the Bid documents. When the Agreement is executed, the guarantees of the unsuccessful Bidders may be returned upon Bidder's request. The Proposal Guarantee of the successful Bidder will be retained until the payment bond and performance bond have been executed and approved, after which it may be returned upon the successful Bidder's request. Attorneys-in-fact who sign Bid Bonds must file with each bond a certified and effective dated copy of their power of attorney.

8. SUBCONTRACTORS AND MANUFACTURERS

8.1 Pursuant to Section 13-4-31 through 13-4-43 NMSA 1978, the Bidder shall submit the following information for each Subcontractor (Form AF-5) who will perform work or labor or render service to the CONTRACTOR in or about the construction Project in an amount in excess of the listing threshold specified in the Invitation to Bid:

- (a) name of the Subcontractor;
- (b) City or County of the Subcontractor;
- (c) nature of the work which will be done by the Subcontractor (Category of Work).

8.2 This listing threshold is five thousand dollars (\$5,000) or one-half of one percent of the architect's,

engineer's, or OWNER's estimate of the total Project cost, whichever is greater. There shall be only one name submitted for each classification as defined by the CONTRACTOR in his Bid.

8.3 The Bidder may be required to establish the reliability and responsibility of the proposed Subcontractors or of any manufacturer to furnish and perform the work in accordance with the Contract Documents and completion schedule, and may also be required to require performance and payment bonds of some or all Subcontractors in conformance with Sec. 13-4-37 NMSA 1978.

9. WITHDRAWAL OF BIDS

9.1 Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid after the Bid opening until the time for award stipulated below has expired. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the Bidder.

10. OWNER'S INVESTIGATIONS

10.1 The OWNER may make such investigations as it deems necessary to determine the ability of the Bidder to perform the Work. The Bidder may be requested to complete and submit a Statement of Bidder's Qualifications (Form AF-8) and shall furnish to the OWNER all such requests. The OWNER reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the OWNER that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated by it; and such rejection shall not give rise to a cause of action against the OWNER or Engineer, or impose a requirement upon the OWNER or Engineer to divulge the information upon which such rejection is based.

11. NOTICE OF AWARD

11.1 Within ninety (90) days after the time announced for opening Bids, the OWNER may act either to accept a Bid or to reject all Bids. A conditional, qualified or unbalanced Bid may, at the discretion of the OWNER, be rejected. Failure to the OWNER to accept a Bid within the said time, or such additional time as the apparent lowest responsive Bidder shall agree to extend his Bid, shall constitute rejection of all Bids. The OWNER may waive any informalities or minor defects or reject any and all Bids.

11.2 The OWNER may, unless otherwise noted on the Bid Proposal, award separate Contracts for the work

contained in each Bid Proposal, or, in the interest of continuity, to one CONTRACTOR for two or more Bid Proposals.

11.3 The acceptance of a Bid will be evidenced by a Notice of Award (Form AF-9) in writing signed by a duly authorized representative of the OWNER and delivered to the Bidder whose Bid is accepted, in the manner provided for giving written notices (reference paragraph 17.1 of the Conditions of Contract). No other act of the OWNER shall constitute acceptance of a Bid. The acceptance of a Bid shall obligate the Bidder whose Bid is accepted to acknowledge acceptance of the Notice of Award, furnish a performance bond and a labor, material and tax payment bond, if required, and execute the Contract (reference paragraphs 14 of the Bidding Requirements, and Section 1 of the Conditions of Contract, definition for "Contract Documents") and any or all other documents.

12. PERFORMANCE AND PAYMENT BONDS

12.1 A performance bond and a labor, material and tax payment bond (Forms AF-11, AF-12), each in the amount of 100 percent of the Contract Price, with a corporate surety approved by the OWNER, will be required for the faithful performance of the Contract on the forms provided by the OWNER.

12.2 Attorneys-in-fact who sign the payment bond and performance bond must file with each bond a dated, certified and effective copy of their power of attorney.

13. AUTHORIZATION TO DO BUSINESS

13.1 The successful Bidder(s) will be required, prior to execution of the Contract, to carry out all procedures required by anyone having jurisdiction over the site of the Work to gain authorization to do business in that jurisdiction.

14. EXECUTION OF CONTRACT

14.1 The party to whom the Contract is awarded will be required to execute the Agreement (Form AF-10) and obtain the performance bond and labor, material and tax payment bond and other required Contract Documents within ten (10) calendar days from the date when the Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement, bond forms and other required Contract Documents. In case of failure of the Bidder to execute the Agreement, the OWNER may, at his option, consider the Bidder in default, in which case the Proposal Guarantee accompanying the proposal shall become the property of the OWNER.

14.2 The OWNER, within ten (10) days of receipt of acceptable performance bond and labor, material and tax payment bond, Agreement, and other required Contract documents, shall sign the Agreement and return to such

party a certified copy of the Contract. Should the OWNER not execute the Agreement within such period, the Bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

14.3 The Contract Documents shall be executed with one (1) original, and five (5) certified copies, distributed as follows:

CONTRACTOR

1 certified copy

City of Farmington City Clerk

1 original

City of Farmington

3 certified copies

Bonding Company

1 certified copy

15. PRE-BID CONFERENCE

15.1 The purpose of this conference is to answer any questions, as might arise, with respect to the Bidding requirements and execution of this Contract. Questions resolved at this meeting will be included in the recording and will be kept in the Bid file. Bidders interested in receiving the recording may obtain them by accessing the Purchasing page of the City of Farmington website, www.fmtn.org or by calling (505) 599-1373.

16. CONTRACT TIME - LIQUIDATED DAMAGES

16.1 The number of days for completion of the Work and provisions for liquidated damages, if any, are set forth in the Invitation to Bid and are incorporated by reference into the Contract Documents.

17. QUANTITIES

17.1 The quantities set forth in the Bid Proposal are estimated quantities on which Bids will be compared and which will be the basis for award of Contract. Payment will be made for the Work actually performed. The OWNER reserves the right to increase or decrease quantities by any reasonable amount to suit the best interest of the OWNER.

18. COLLUSION-GENUINE BID

18.1 The Bidder, by submitting a Bid, certifies that the Bid is genuine and is not sham or collusive, or made in the interest, or in the behalf of any person not named as Bidder, and that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a sham bid, or any other person, firm or corporation to refrain from bidding, and that the Bidder has not in any manner sought by collusion to secure himself an advantage over any

other Bidder.

19. LICENSE OR ROYALTY FEES

19.1 Both license and royalty fees for products or for a process must be paid directly by the CONTRACTOR.

20. PREFERENCES AND STANDARDS FOR PROCESSES, MATERIALS AND EQUIPMENT

20.1 Unless specified in the Contract Documents, the OWNER has no preference for any process, type of equipment or kinds of material but will consider all processes, types of equipment or kinds of material offered which meet specifications on an equal competitive basis if they are in fact equal to those specified and will accomplish the purpose intended. The OWNER reserves the right to be the sole judge as to whether or not a different process type of equipment or kind of material offered is in fact the equal to that specified.

21. PROJECT FINANCE

21.1 Any Contract awarded under this Invitation for Bid shall be subject to the appropriation of funds by the OWNER's City Council.

22. WAGE RATES AND NON-DISCRIMINATION IN EMPLOYMENT

22.1 The Bidder's attention is directed to the fact that wages to be paid on this project shall not be less than the prevailing wage rates as listed by the New Mexico Labor and Industrial Division and (where applicable) the prevailing Federal Wage Rate Decision listed by the U.S. Department of Labor and in effect at the time of this Contract. It shall be the Bidder's responsibility to inform himself thoroughly of all state, federal, and local laws and statutes pertaining to the employment of labor, the freedom of organization, and the conditions of employment and shall strictly adhere to such laws and regulations as are applicable. There shall be no discrimination because of race, creed, color, national origin, sex or legal political affiliation in the employment of persons qualified by training and experience for work under this Contract.

23. FEDERAL ASSISTED CONSTRUCTION CONTRACTS

23.1 NOTICE OF REQUIREMENT FOR CERTIFICATION OF NON-SEGREGATED FACILITIES

23.1.1. Bidders are cautioned as follows: By signing the Contract for which this Bid is solicited, the Bidder will be deemed to have signed and agreed to the provisions of the "Certification to Non-segregated Facilities" as contained in the Specifications for this Project.

23.2 NOTICE TO PROSPECTIVE FEDERALLY ASSISTED CONSTRUCTION CONTRACTORS

23.2.1. A certification of Non-segregated Facilities, as required by the May 28, 1968 order (33 F.R. 7808, May 28, 1968; 41 CFR Part 60-1, et seq) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a federally assisted construction contract exceeding Ten Thousand Dollars (\$10,000.00) which is not exempt from the provisions of the Equal Opportunity clause.

23.2.2. CONTRACTORS receiving federally assisted construction contract awards exceeding Ten Thousand Dollars (\$10,000.00) which are not exempt from the provisions of the Equal Opportunity clause will be required to provide for the forwarding of this notice to prospective Subcontractors for supplies and construction contracts where the subcontracts exceed Ten Thousand Dollars (\$10,000.00) and are not exempt from the provisions of the Equal Opportunity clause.

23.2.3. Certification by Bidder regarding Equal Employment Opportunity must be submitted with each Bid.

23.3 DEBARMENT, SUSPENSION, AND INELIGIBILITY

23.3.1 By submitting a response to this solicitation (RFQ, Bid, RFP) the business (Bidder/Offeror/Contractor) represents and warrants that it is not debarred, suspended, or placed in ineligibility status under the provisions of Federal Executive Order 12549.

24. EQUAL EMPLOYMENT OPPORTUNITY

24.1 During the performance of this Contract, the CONTRACTOR agrees as follows:

24.1.1. The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, 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, religion, creed, color, 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 selecting for training, including apprenticeship.

24.1.2. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices as provided setting forth the provisions of this nondiscrimination clause.

24.1.3. The CONTRACTOR will, in all solicitations or advertisements for employment placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, or national origin.

24.1.4. The CONTRACTOR will send to each labor union or representative of workers with which he has collective bargaining agreements or other contracts or understandings, a notice advising the labor union or worker's representative of the CONTRACTORS' commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

24.1.5. The CONTRACTOR will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

24.1.6. The CONTRACTOR will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to CONTRACTOR's books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

24.1.7. In the event of the CONTRACTOR's noncompliance with the nondiscrimination clauses of this Contract or with any of such 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 in accordance with procedures authorized in Executive Order No. 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 contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the CONTRACTOR becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such

direction by the contracting agency, the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

25. COMPLIANCE WITH FEDERAL REGULATIONS

25.1 The CONTRACTOR agrees to comply with any Federal Statutes or Regulations which are applicable to this Project including, but not limited to, the following:

25.1.1. All labor standards including those relating to the payment of wages, working conditions, anti-kickback prohibitions and equal employment, and in particular:

25.1.1.1. The provisions of Title 29 of the Office of the Secretary of Labor of the United States Government, Part 3, entitled "Contractors and Subcontractors on Public Building or Public Work Financed in whole or in part by loans or grants from the United States" (29 CFR Part 3);

25.1.1.2. The provisions of 29 CFR Part 5 entitled "Labor Standard Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction" as well as the "Labor Standard Provisions Applicable to Non-construction Contracts Subject to Contract Work Hours and Safety Standards Act".

25.1.2. Those concerning relocation and related payments to in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 USC 4601 et seq;

25.1.3. The National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq);

25.1.4. The Clean Air Act, as amended (42 USC 1857-1858 a);

25.1.5. The Federal Water Pollution Control Act, as amended (33 USC 1251-1376);

25.1.6. The National Historic Preservation Act of 1966, as amended (16 USC 470 et seq);

25.1.7. The Wild and Scenic Rivers Act (16 USC 1271-1281);

25.1.8. The Endangered Species Act of 1973, as amended (16 USC 1531 et seq);

25.1.9. The Historic Sites, Buildings and Antiquities Act, as amended (16 USC 461 et seq);

25.1.10. The Americans with Disabilities Act of 1990 (P.L.101-336, July 26, 1990), and any regulations adopted pursuant thereto;

25.1.11. The National Flood Insurance Act of 1968, as amended.

25.1.12. The National Pollutant Discharge Elimination System Regulations for Storm Water Discharges, 40 CFR Parts 122, 123 and 124.

26. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

26.1 In order to protect the lives and health of his employees, the CONTRACTOR shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act as amended, commonly known as the Construction Safety Act and also known as the Williams-Steiger Occupational Safety and Health Act of 1970, together with the regulations promulgated in 29 CFR, Parts 1901 through Parts 1919.

27. BID OPENING PROCEDURE

27.1 The person or persons opening the Bids will do the following for each Bid submitted:

27.1.1. Announce the name of the Bidder and the number of the Bidder's New Mexico Contractors license.

27.1.2. Check for acknowledgment of Addenda.

27.1.3. Check for proper signature on Invitation to Bid.

27.1.4. Check for Proposal Guarantee.

27.1.5. Check other requirements on Invitation to Bid and Contractor's Checklist (Form AF-1(b)).

27.1.6. Read Bid aloud.

27.2 If any of the foregoing requirements have not been met, the Bid shall be read after the deficiency or deficiencies have been announced and noted. The OWNER reserves the right to waive any condition, requirements, or technicality in the deficient Bid, this being entirely at the discretion of the OWNER.

28. PROTEST DEADLINE

28.1 Any protest by a Bidder must be timely and in conformance with Section 13-1-172, NMSA, 1978 and applicable procurement regulations. The fifteen (15) day protest period for responsive Bidders shall begin on the day following the City's written notification to all responding Bidders. Protests must be written and must include the name and address of the protestor and the number assigned to this Bid by the City. It also must

contain a statement of grounds for protest including appropriate supporting exhibits. The timely protest must be delivered to:

Chief Procurement Officer
Central Purchasing Division
City of Farmington
800 Municipal Drive (Mailing Address) OR
805 Municipal Drive (Physical Location)
Farmington, NM 87401-2663

29. DEFINITIONS

29.1 The definitions, as described in the Conditions of Contract, included in these bidding documents, shall also be applied and used for bidding purposes.

30. BRIBES; GRATUITIES AND KICKBACKS

30.1 By law (Section 13-1-191, NMSA, 1978) the City is required to inform Bidders of the following: (1) it is a third-degree felony under New Mexico law to commit the offense of bribery of a public officer or public employee (Section 30-24-1, NMSA, 1978); (2) it is a third-degree felony to commit the offense of demanding or receiving a bribe by a public officer or public employee (Section 30-24-2, NMSA, 1978); (3) it is a fourth-degree felony to commit the offense of soliciting or receiving illegal kickbacks (Section 30-41-1, NMSA, 1978); (4) it is a fourth-degree felony to commit the offense of offering or paying illegal kickbacks (Section 30-41-2, NMSA, 1978).

31. CONFLICT OF INTEREST

31.1 Offeror warrants that it presently has no interest and will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of service under this contract.

31.2 Offeror must notify the City's Chief Procurement Officer if any employee(s) of the requesting department or the Central Purchasing Division have a financial interest in the Offeror. If yes, the Offeror must specify the employee(s) name in their proposal.

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II SPECIAL CONDITIONS

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SPECIAL CONDITIONS

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SPECIAL CONDITIONS

The following revisions, additions and deletions modify referenced sections of the General Conditions of the Bidding Requirements and Contract Documents for the City of Farmington for Construction Contracts, and are hereby made part of the Contract Documents.

1. CONTRACTOR'S DRUG TESTING POLICIES AND PROCEDURES:

The **awarded** CONTRACTOR must submit their drug-free work place policy to the City of Farmington within 48 hours of the Notice of Award. If applicable, the Commercial Driver's License (CDL) requirements must be met within one (1) week of the Notice of Award. The CDL drug/alcohol testing policies and procedures must comply with Department of Transportation (DOT) drug-testing regulations as set forth in 49 CFR Part 40 and Part 382.

In addition, the CONTRACTOR must have in place a drug/alcohol free workplace policy that applies to all employees of this work-site. This policy should include provisions for reasonable suspicion, pre-employment, and post-accident drug/alcohol testing.

2. STATE OF NEW MEXICO DEPARTMENT OF WORKFORCE SOLUTIONS, REGISTRATION OF CONTRACTORS:

In compliance with Public Works Section 13-4-13.1 NMSA 1978, Public Works Contracts, Registration of Contractors and Subcontractors. Contractors submitting bid pricing more than \$60,000 shall be registered with the New Mexico Department of Workforce Solutions prior to submitting a bid to the City of Farmington. If a Contractor is not registered at the time of Bid opening, their Bid shall be considered non-responsive and will be rejected. Contractor's subcontractors shall also be registered. If a Contractor's Bid includes any subcontractor that is not registered, their Bid may be considered for award following substitution of a registered subcontractor for any unregistered subcontractor in accordance with Section 13-4-36 NMSA 1978. Bidders may find additional information on the registration requirements and forms at the following website: <http://www.dws.state.nm.us/dws-pubwage.html>

In conformance with Sections 13-4-37 and 13-1-148.1 NMSA 1978 a subcontractor shall provide a performance and payment bond if the subcontractor's contract for work to be performed is valued at one hundred twenty-five thousand dollars (\$125,000) or more.

3. DRAWINGS AND SPECIFICATIONS

One (1) paper copy of the full size drawings and one (1) CD of the specifications and drawings will be provided to the awarded contractor.

4. CONFLICTING CONTRACT PROVISIONS:

If the CONTRACTOR finds a conflict between the Contract Document provisions provided by the Owner and those provided by the Federal Aviation Administration, he shall call it to the Owner's attention in writing at once and before proceeding with the Work affected. However, CONTRACTOR shall not be liable to Owner for his failure to discover any conflict, errors, and discrepancies. It shall be the responsibility of the Owner to determine which positions will prevail.

5. NM RESIDENT CONTRACTOR PREFERENCE

Pursuant to Section 13-4-3 NMSA 1978 the provisions of 13-4-1 through 13-4-4 NMSA 1978 shall not apply. Therefore, the resident contractor preference is not applicable.

6. AVAILABILITY OF FUNDS

The scope of the project may be revised prior to award depending on the availability of funds. If the Contract is to be awarded, it will be awarded based on the lowest responsive Bid total of the awarded items.

III

TECHNICAL

SPECIFICATIONS

III
TECHNICAL
SPECIFICATIONS

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TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

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S - 1
MOBILIZATION

DESCRIPTION

S-1-1.1

This Work consists of the mobilization of personnel, equipment and supplies to the Project site in preparation for Work on the Project. This item shall also include the establishment of the Contractor's offices, buildings and other necessary facilities and all other costs incurred for labor and operation which must be performed prior to beginning the other items under the Contract.

BASIS OF PAYMENT

S-1-2.1

Partial payments for mobilization will be made once each month as the Work progresses. These partial payments will be made as follows:

- A. When 5 percent of the Original Contract Amount is earned, 25 percent of the amount bid for mobilization, or 2 ½ percent of the original contract amount, whichever is less, will be paid.
- B. When 10 percent of the Original Contract Amount is earned, 50 percent of the amount bid for mobilization, or 5 percent of the original contract amount, whichever is less, will be paid.
- C. When 25 percent of the Original Contract Amount is earned, 60 percent of the amount bid for mobilization, or 6 percent of the original contract amount, whichever is less, will be paid.
- D. When 50 percent of the Original Contract Amount is earned, 100 percent of the amount bid for mobilization, or 10 percent of the original contract amount, whichever is less, will be paid.
- E. Upon completion of all work on the project, payment on any amount bid for mobilization in excess of 10 percent of the original contract amount will be paid.
- F. The total sum of all payments shall not exceed the Original Contract Amount bid for the item, regardless of the fact that the Contractor may have, for any reason, shut down the Work on the Project or moved equipment away from the Project and then back again.

Payments for materials on hand will not be included as a percent of Original Contract Amount earned until said materials in hand have been incorporated into the Work and accepted and paid for as contract items.

Payment will be full compensation for all Work necessary to complete the item.

Payment will be made under:

Item S - 1 Mobilization - per lump sum

END OF ITEM S - 1

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ITEM S-2 REMOVALS

DESCRIPTION

S-2-1.1

This Work consists of the removal and disposal of signs, edge lights, asphalt pavement, concrete foundations, pipes, inlets, aircraft tie downs, duct banks, light poles, buildings, and any other obstructions that are not designated or permitted to remain. It shall also include salvaging, stockpiling and loading salvable materials, sandblasting, plugging structures, cleaning culverts, and sawing and cutting to facilitate controlled breaking and removal of concrete and asphalt to a neat line. Except in areas to be excavated, the resulting trenches, holes, and pits shall be backfilled.

Materials removed and not designated to be salvaged or incorporated into the Work shall become the property of the Contractor and shall be disposed of off the Airport property in accordance with all local, State, and Federal legal requirements.

GENERAL

S-2-2.1

The Contractor shall raze, remove, and dispose of all structures and obstructions which are identified on the Project, except utilities, structures and obstructions removed under other Contractual Agreements.

Fence removals shall include backfilling all post holes with suitable material.

Cavities left by structure removal shall be filled to the level of the surrounding ground with suitable material and, if within the construction limits, shall be compacted in accordance with Section P-152.

Culverts and other drainage structures shall not be removed until satisfactory arrangements have been made to accommodate drainage.

Operations used to remove existing structures or obstructions, which may damage new construction, shall be completed prior to placing the new Work.

Where portions of structures are to be removed, the portions designated to remain shall be prepared to fit the new construction, and shall be protected from damage. All damage to structures designated to remain in place shall be repaired at the Contractor's expense. Method of repair shall be approved by the Engineer.

Sawing of concrete or asphalt shall be done to a true line, with a vertical face, unless otherwise specified. The minimum depth of a saw cut in concrete shall be 2 inches or to the depth of the reinforcing steel, whichever occurs first. Sawing is considered incidental.

Removed materials, not designated to be salvaged, shall be hauled off Airport property and properly disposed of by the Contractor.

SALVABLE MATERIAL

S-2-3.1

All salvable material designated in the Contract to be relocated or remain the property of the Airport shall be removed without damage, in sections or pieces which may be readily transported, and shall be stockpiled by the Contractor at specified locations within the Project limits. The Contractor shall safeguard salvable materials and shall be responsible for the expense of repairing or replacing damaged or missing material until it is incorporated into the Work.

PORTIONS OF STRUCTURES

S-2-4.1

Unless otherwise directed, the substructures of existing structures shall be removed to 1 foot below natural ground surface. Where such portions of existing structures lie wholly or in part within the limits of a new structure, they shall be removed as necessary to accommodate the construction of the proposed structure

Reinforcing steel projecting from the structure, designated to remain, shall be cleaned and aligned to the new construction. Required dowels shall be securely grouted with approved grout. When concrete is removed, all exposed reinforcing steel designated to remain in place shall be cleaned by sandblasting to sound steel free of oil, dirt, concrete fragments or laitance, loose rust scale, and other coatings that would destroy or inhibit the bond with the new concrete.

Adequate measures shall be taken by the Contractor to protect the steel from contamination or corrosion. Reinforcing steel, contaminated as a result of the Contractor's failure to provide adequate protection, shall be re-sandblasted at the Contractor's expense with no allowance for Contract Time Extension.

A protective device shall be placed between the sandblasting operations and the traveling public.

REMOVAL OF ASPHALT MAT (FULL DEPTH)

S-2-5.1

This Work consists of the complete removal of designated asphalt pavements. Asphalt pavement shall be rotomilled, salvaged, and stockpiled in the construction staging area or as directed by the Engineer. Any asphalt thicknesses shown on the plans are based on available records and are approximate. Variations in asphalt pavement thicknesses shall be verified by the Contractor prior to establishing the Contract Unit Price Bid and shall be included in the Contract Unit Price as Bid.

REMOVAL OF DUCT BANK

S-2-5.1

This Work consists of the complete removal and disposal of designated concrete encased duct banks that are to be replaced. Removal includes all associated concrete, conduit, wire, and junction boxes. Existing wire and conduit entering the junction boxes from other points besides the duct bank that will be removed, shall be preserved so that it may be installed in the new junction boxes (splice bases) that will replace the existing junction boxes.

METHOD OF MEASUREMENT

S-2-6.1

The Contract provides for payment for the removal of specific items on a unit basis and measurement will be by the unit completed and accepted.

BASIS OF PAYMENT

S-2-7.1

The accepted quantities will be paid for at the Contract Unit Price for each of the pay items listed below. Payment shall be full compensation for sawing, removing, disposal, excavation and subsequent backfill, and salvage of materials removed, their custody, preservation, storage, and disposal as provided herein. All other items removed in order to construct various items of Work shall be considered incidental to and included in the cost of the related pay item.

Payment will be made under:

Item S-2a	Remove and Salvage Asphalt Mat (Rotomil Full Depth) - per square yard
Item S-2b	Remove Concrete Encased Duct Bank - per each
Item S-2c	Remove Retroreflective Edge Marker- per each
Item S-2d	Remove Taxiway Edge Light - per each

END OF ITEM S-2

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ITEM S-3 RESET STRUCTURES

DESCRIPTION

S-3-1.1

This item consists of removing and relaying, resetting, or adjusting structures and related materials. All designated items shall be carefully removed and stored, reinstalled, or adjusted, in a manner that will avoid loss or damage.

CONSTRUCTION REQUIREMENTS

S-3-2.1

Reset structures shall be cleaned of foreign material prior to reinstallation.

Except in areas to be excavated, all holes resulting from the removal of structures shall be neatly backfilled. Methods shall conform to those required in the Specifications for the various types of construction involved.

Materials in good condition from removed structures may be reused. Salvable material, as designated in the Contract, that is not reused shall remain the property of the Airport, and the Contractor shall be held responsible for safekeeping of all materials until receipted by the Airport. Materials damaged, stolen, or lost prior to receipt by the Airport shall be repaired or replaced as determined by the Engineer, at no cost to the Airport.

Compaction for all items will be as required in Section P-152.

RELOCATE TAXIWAY EDGE LIGHT AND SIGN

S-3-3.1

Lights and signs designated to be relocated shall be removed, cleaned, and reset at designated locations, including all Work necessary to provide the existing posts with break-away devices, where required. Work includes all necessary electrical work and materials to reconnect the lights and signs to the existing electrical circuits.

ADJUST TAXIWAY EDGE LIGHTS

S-3-4.1

Taxiway edge lights that will be required to be adjusted for height shall be removed, cleaned, and reset in their existing location to the proper height as shown in the plans. Work includes all necessary electrical work and materials to reinstall the lights according to the plan details and reconnect the lights and signs to the existing electrical circuits.

METHOD OF MEASUREMENT

S-3-5.1

The quantity to be measured where items are reset or adjusted on an "each" or "lump sum" basis shall be the actual number of those items restored for service at new location, completed and accepted. Excavation, backfill, compaction, concrete, and all other incidentals will not be measured and paid for separately but shall be included in the Work.

BASIS OF PAYMENT

S-3-6.1

The accepted quantities, measured as provided above, will be paid for at the Contract Price for each of the Pay Items listed below that appear in the Bid Schedule. This price shall fully compensate for all incidental items associated with the relocation of the designated item including but not limited to; all electrical labor including, wiring, trenching, and backfilling, materials including any wire, cable, counterpoise, grounding rods, concrete, and all materials required to reset the sign or light and the electrical circuit in the designated reset location.

Payment will be made under:

Item S-3a	Relocate Sign - per each
Item S-3b	Adjust Height of Taxiway Edge Lights - per lump sum

Excavation, backfill, compaction, concrete, and all other incidentals will not be measured and paid for separately but shall be included in the Work.

END OF ITEMS S-3

**ITEM S-6
WATERING**

DESCRIPTION

S-6-1.1

This item shall consist of furnishing and applying water required in the compaction of embankments, subgrades, subbases, base courses, for dust control, and for other purposes in accordance with the requirements of these Specifications or as directed by the Engineer.

CONSTRUCTION METHODS

S-6-2.1

Water, when required, shall be applied at the locations, in the amounts, and during the hours, including nights, as directed by the Engineer. An adequate water supply shall be provided by the Contractor. The equipment used for watering shall be of ample capacity and of such design as to assure uniform application of water in the amounts directed by the Engineer.

METHOD OF MEASUREMENT

S-6-3.1

No measurement will be made of water on any part of the Work. If any material is prewetted prior to weighing, the weight of the water shall be deducted from the scale weight.

BASIS OF PAYMENT

S-6-4.1

No payment will be made separately or directly for water on any part of the Work. Water will be considered a necessary and incidental part of the Work and the Contractor shall include its cost in the Contract Unit Price for the pay items of Work involved.

END OF ITEM S-6

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**ITEM S-601
CRACK SEALING**

DESCRIPTION

S-601-1.1

This Work shall consist of the placing of a hot sealant into the existing cracks in the bituminous pavement in accordance with these Specifications and in the locations designated by the Engineer.

MATERIALS

S-601-2.1 POLYMERIC ASPHALT-RUBBER SEALANT.

Polymeric asphalt-rubber sealant shall meet the requirements of ASTM D6690, Type II.

CONSTRUCTION METHODS

S-601-3.1 EQUIPMENT.

The equipment used by the Contractor shall include a mechanical crack router; power broom; an air compressor, or hot compressed air lance, of sufficient capacity to clean out all cracks; an asphalt kettle with pressure hose and nozzle; squeegees and any other equipment recommended by the manufacturer.

The asphalt-rubber mixture shall be heated in a double boiler pot in order to keep to a minimum any localized heating. The mixture shall be combined, mixed, heated and placed in accordance with the manufacturer's recommendations.

S-601-3.2 CRACK TREATMENT CRITERIA.

Cracks less than 1/8 inch in width shall not be sealed. All cracks in excess of 1/8 inch and less than 1/2 inch in width, shall be routed to a width of 1/2 inch and depth of 3/4 inch prior to sealing. Cracks in excess of 1/2 inch will not have to be routed but shall be cleaned to remove dirt, old crack sealer, vegetation and asphalt from the cracks. Cracks excessively deep shall be prefilled to within 1-1/2 inches of the top with an approved compressible material or sand meeting the requirements of ASTM C-33 and Table 2 in Section P-610 prior to sealing.

S-601-3.3 SURFACE PREPARATION.

All cracks that are to be sealed shall be thoroughly cleaned by blowing them out with an air compressor or air lance. The purpose of routing and cleaning the cracks is to provide a sealant reservoir and to ensure good clean vertical asphalt surfaces to which the sealant can bond. The Contractor's operation will be monitored to ensure that these objectives are met.

All cracks to be sealed (whether routed or not) shall have all dirt, old crack sealer, vegetation and asphalt removed for the full depth to be filled with crack sealant.

S-601-3.4 APPLICATION OF CRACK SEALANT.

Cracks shall be filled with sealant to not less than 1/8 inch nor more than 1/4 inch below the pavement surface. After filling the cracks, the sealant may be squeegeed, only if necessary, to ensure that no sealant protrudes above the existing pavement surfaces. The crack-filling rate and squeegeing shall be controlled so as to not have excessive material squeegeed on the surface of the pavement. Excessive material on the pavement surface shall be reason for the Project Inspector to stop the operation until the Contractor satisfactorily demonstrates a technique to avoid excessive

material on the pavement surface. Excessive material on the pavement surface combined with the heat of overlay asphaltic concrete could result in a slippery area which causes slippage when the asphaltic concrete overlay is rolled with a resulting hump in the finished pavement.

The Contractor shall be required to keep the Work areas clean at all times. All removed crack sealer shall be removed from the airport. Portions of the taxiways and apron area may have to remain operational during the day. Work schedules and requirements for entering operational areas shall be coordinated with the Airport Manager and/or the Engineer.

ACCEPTANCE PROCEDURES

S-601-4.1

The material suppliers shall conduct laboratory tests on all material supplied and shall certify that the materials meet the Contract Specifications.

The Contractor shall deliver to the Engineer the test results from the suppliers and certifications signed by an authorized representative of the supplier that all material delivered meets all Contract Specifications.

If the material does not meet the Project Specifications, it will be rejected and shall be removed, including all Work in which the rejected material has been incorporated and replaced at no additional cost to the Owner.

METHOD OF MEASUREMENT

S-601-5.1

The amount of crack sealing to be paid for shall be the number of tons of bituminous sealant material utilized to fill the cracks. The Contractor shall measure and record daily all bituminous sealant material delivered and placed in the cracks and shall give the records in written form to the Engineer's Field Representative daily.

BASIS OF PAYMENT

S-601-6.1

Payment will be made at the Contract Unit Price per ton for crack sealing. This price shall be full compensation for furnishing all materials, for preparation and cleaning all cracks, for the installation of all materials and for all labor, equipment, tools and incidentals necessary to complete the items including routing, and any other Work necessary to complete the items.

Payment will be made under:

Item S-601	Crack Sealing - per ton
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END OF ITEM S-601

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 Engineer.

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.

Clearing, when so designated, shall consist of the cutting and removal of isolated single trees or isolated groups of trees. The cutting of all the trees of this classification shall be in accordance with the requirements for the particular area being cleared, or as shown on the plans, or as directed by the Engineer. The trees shall be considered isolated when they are 40 feet or more apart, with the exception of a small clump of approximately 5 trees or less.

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 Engineer 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 by burning or otherwise.

CONSTRUCTION METHODS

151-2.1 GENERAL.

The Engineer shall stake the areas denoted on the plans to be cleared or cleared and grubbed on the ground. The clearing and grubbing shall be done at a satisfactory distance in advance of the grading operations.

All spoil materials removed by clearing or by clearing and grubbing shall be disposed of by burning, when permitted by local laws, or by removal to approved disposal areas. When burning of material is permitted, it shall be burned under the constant care of competent watchmen so that the surrounding vegetation and other adjacent property will not be jeopardized. Burning shall be done in accordance with all applicable laws, ordinances and regulations. Before starting any burning operations, the Contractor shall notify the agency having jurisdiction.

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 Engineer and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits at his/her own expense, he shall obtain and file with the

Engineer, permission in writing from the property owner for the use of private property for this purpose.

If the plans or the specifications require the saving of merchantable timber, the Contractor shall trim the limbs and tops from designated trees, saw them into suitable lengths and make the material available for removal by other agencies.

Any blasting necessary shall be done at the Contractor's responsibility and the utmost care shall be taken not to endanger life or property.

The removal of existing structure and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone or telegraph pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the Engineer who will notify the proper local authority or owner and attempt to secure prompt action.

151-2.2 CLEARING.

The Contractor shall clear the staked or indicated area of all objectionable materials. Trees unavoidably falling outside the specified limits must be cut up, removed and disposed of in a satisfactory manner. In order to minimize damage to trees that are to be left standing, trees shall be felled toward the center of 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 to a height of not more than 12 inches above the ground. The grubbing of stumps and roots will not be required.

When isolated trees are designated for clearing, the trees shall be classed in accordance with the butt diameter size as measured at a point 18 inches above the ground level or at a designated height specified in the proposal.

Fences shall be removed and disposed of when directed by the Engineer. 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 designated location if the fence is to remain the property of a local owner or of a civic 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 shall be removed, except where embankments exceeding 3-1/2 feet in depth are to be made outside of paved areas. In cases where such depth of embankments is to be made, all unsatisfactory materials shall be removed, but sound trees, stumps and brush can be cut off within 6 inches above the ground and allowed to remain. Tap roots and other projections over 1-1/2 inches in diameter shall be grubbed out to a depth of at least 18 inches 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 from there shall be disposed of either by burning or otherwise removed from the site. The remaining or existing foundations, wells, cesspools and all like structures shall be destroyed by breaking out or breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet 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. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes remaining after the grubbing operation in embankment areas shall have the sides broken down to flatten out the slopes and shall be filled with acceptable material, moistened and properly compacted in layers to the density required in Item P-152. The same construction procedure shall be applied to all holes remaining after grubbing in excavation areas where the depth of holes exceeds the depth of the proposed excavation.

METHOD OF MEASUREMENT

151-3.1

Clearing and grubbing shall not be measured for payment.

BASIS OF PAYMENT

151-4.1

No direct Payment shall be made for clearing and grubbing. The cost of furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete the item shall be incidental to P-152 Excavation and Embankment.

END OF ITEM P - 151

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**ITEM P-152
EXCAVATION 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 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 section(s) 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 the following items.

b. Rock Excavation. (DELETED)

c. Muck Excavation. (DELETED)

d. Drainage Excavation. (DELETED)

e. Borrow Excavation. (DELETED)

152-1.3 UNSUITABLE EXCAVATION.

Any material containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material, when approved by the Engineer as suitable to support vegetation, may be used on the embankment slope.

CONSTRUCTION METHODS

152-2.1 GENERAL.

Before beginning excavation, grading, and embankment operations in any area, the area shall be completely 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 Engineer. All unsuitable material shall be disposed of in waste areas shown on the plans. All waste areas shall be graded to allow positive drainage of the area and of adjacent areas. The surface elevation of waste areas shall not extend above the surface elevation of adjacent usable areas of the airport, unless specified on the plans or approved by the Engineer.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the pavement areas in which the top layer of soil material has become compacted, by hauling or other activities of the Contractor shall be scarified and disked to a depth of 4 inches, in order to loosen and pulverize the soil.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor shall, at his/her own expense, 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.

152-2.2 EXCAVATION.

No excavation shall be started until the work has been staked out by the Contractor and the Engineer has obtained elevations and measurements of the ground surface. All suitable excavated material shall be used in the formation of embankment, subgrade, or for other purposes shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or disposed of as directed. When the volume of excavation is not sufficient for constructing the fill to the grades indicated, the deficiency shall be obtained from borrow areas.

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

a. Selective Grading. When selective grading is indicated on the plans, the more suitable material as designated by the Engineer shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas so that it can be measured for payment for rehandling as specified in paragraph 3.3.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turbing shall be excavated to a minimum depth of 12 inches, or to the depth specified by the Engineer, below the subgrade. 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. This excavated material shall be paid for at the contract unit price per square yard for unclassified excavation. The excavated area shall be refilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary refilling will constitute a part of the embankment. Where rock cuts are made and refilled with selected material, any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

c. Overbreak. Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his/her decision shall be final. All overbreak shall be graded or removed by the Contractor and disposed of as directed; however, payment will not be made for the removal and disposal of overbreak that the

Engineer determines as avoidable. Unavoidable overbreak will be classified as "Unclassified Excavation."

d. Removal of Utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by someone other than the Contractor, e.g., the utility unless otherwise shown on the plans. All existing foundations shall be excavated for at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed. All foundations thus excavated shall be backfilled with suitable material and compacted as specified herein.

e. Compaction Requirements. The subgrade under areas to be paved shall be compacted to a depth of 6 inches 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 +/- 2 percent of optimum moisture content before rolled to obtain the prescribed compaction (except for expansive soils).

The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade. The finished grading operations, conforming to the typical cross section, shall be completed and maintained at least 1,000 feet ahead of the paving operations or as directed by the Engineer.

In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line of finished grade of slope. All cut-and-fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the plans or as directed by the Engineer.

Blasting will be permitted only when proper precautions are taken for the safety of all persons, the work, and the property. All damage done to the work or property shall be repaired at the Contractor's expense. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all state and local regulations and explosive manufacturers' instructions, with applicable approved permits reviewed by the Engineer. Any approval given, however, will not relieve the Contractor of his/her responsibility in blasting operations.

Where blasting is approved, the Contractor shall employ a vibration consultant, approved by the Engineer, to advise on explosive charge weights per delay and to analyze records from seismograph recordings. The seismograph shall be capable of producing a permanent record of the three components of the motion in terms of particle velocity, and in addition shall be capable of internal dynamic calibration.

In each distinct blasting area, where pertinent factors affecting blast vibrations and their effects in the area remain the same, the Contractor shall submit a blasting plan of the initial blasts to the Engineer for approval. This plan must consist of hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without the approval of the engineering.

The Contractor shall keep a record of each blast fired - its date, time and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location.

These records shall be made available to the Engineer on a monthly basis or in tabulated form at other times as required.

152-2.3 BORROW EXCAVATION.

Borrow area(s) 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.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the supply, subject to the approval of the Engineer. The Contractor shall notify the Engineer, at least 15 days prior to beginning the excavation, so necessary measurements and tests can be made. All unsuitable material shall be disposed of by the Contractor. All borrow pits shall be opened up to expose the vertical face of various strata of acceptable material to enable obtaining a uniform product. Borrow pits shall be excavated to regular lines to permit accurate measurements, and they shall be drained and left in a neat, presentable condition with all slopes dressed uniformly.

152-2.4 DRAINAGE EXCAVATION.

Drainage excavation shall consist of excavating for drainage ditches such as intercepting; inlet or outlet, for temporary levee construction; or for any other type as designed or as shown on the plans. The work shall be performed in the proper sequence with the other construction. All satisfactory material shall be placed in fills; unsuitable material shall be placed in waste areas or as directed. Intercepting ditches shall be constructed prior to starting adjacent excavation operations. All necessary work shall be performed to secure a finish true to line, elevation, and cross section.

The Contractor shall maintain ditches constructed on the project to the required cross section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 PREPARATION OF EMBANKMENT AREA.

Where an embankment is to be constructed to a height of 4 feet or less, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches. This area shall then be compacted as indicated in paragraph 2.6. When the height of fill is greater than 4 feet, sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

Where embankments are to be placed on natural slopes steeper than 3 to 1, horizontal benches shall be constructed as shown on the plans.

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.

152-2.6 FORMATION OF EMBANKMENTS.

Embankments shall be formed in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.

The grading operations shall be conducted, and the various soil strata shall be placed, to produce a soil structure as shown on the typical cross section or as directed. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory conditions of the field. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.

The material in the layer shall be within ± 2 percent of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be required when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Sprinkling of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 1,000 square yards. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content in order to achieve the correct embankment density.

Rolling operations shall be continued until the embankment is compacted to not less than 95 percent of maximum density for noncohesive soils, and 90 percent 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 6 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D1557.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches. The in-place field density shall be determined in accordance with ASTM D 6938, ASTM D 1556, or ASTM D 2167. Refer to Section 120.

Compaction areas shall be kept separate, and no layer shall be covered by another until the proper density is obtained.

During construction of the embankment, the Contractor shall route his/her equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of embankments, layer placement shall begin in the deepest portion of the fill; as placement progresses, layers shall be constructed approximately parallel to the finished pavement grade line.

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

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet in thickness. Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of rock. These type lifts shall not be constructed above an elevation 4 feet below the finished subgrade.

Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material.

There will be no separate measurement of payment for compacted embankment, and all costs incidental to placing in layers, compacting, disking, watering, mixing, sloping, and other necessary operations for construction of embankments will be included in the contract price for excavation, borrow, or other items

152-2.7 FINISHING AND PROTECTION OF SUBGRADE.

After the subgrade has been substantially completed the full width shall be conditioned by removing any soft or other unstable material that will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. He/she shall limit hauling over the finished subgrade to that which is essential for construction purposes.

All ruts or rough places that develop in a completed subgrade shall be smoothed and recompacted.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

152-2.8 HAUL.

All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included 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.

152-2.9 TOLERANCES.

In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 16-foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2-inch, or shall not be more than 0.05-foot from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting by sprinkling and rolling.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 foot from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.10 TOPSOIL. (DELETED)

152-2.11 SHOULDER GRADING.

Shoulder grading includes placing, grading, compacting 2-3" of asphalt millings along the pavement edges salvaged from the Taxiway E, F, and G pavement removal. Millings shall be placed uniformly along the pavement edges to a width of 10 feet. Final compacted finish grade shall meet the pavement edge drop and shoulder slope requirements as indicated in the plans, including the required grading beyond the placed millings to match existing grade. Placed millings shall be compacted by steel wheel roller or a method approved by the engineer. Asphalt millings shall be composed of milled bituminous pavement and shall be clean, uniform, and well-graded with a maximum particle size of 2 inches in any dimension.

METHOD OF MEASUREMENT

152-3.1

The quantity of Unclassified Excavation to be paid for shall be the number of cubic yards measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.2

For payment specified by the cubic yard, measurement for all excavation shall be computed by the average end area method. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by excavation cross-sections shown on the plans, subject to verification by the Engineer. After completion of all excavation operations and prior to the placing of base or subbase material, the final excavation shall be verified by the Engineer by means of field cross-sections taken randomly at intervals not exceeding 500 linear feet.

152-3.3

Shoulder Grading shall be paid for on the basis of the number of square yards of 10 ft wide area graded and plated with asphalt millings adjacent to the pavement as indicated on the plans. Required grading to match existing grade beyond the 10ft wide section of millings will not be measured.

BASIS OF PAYMENT

152-4.1

For Unclassified Excavation payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2

For Shoulder Grading payment shall be made at the contract unit price per square yard completed and accepted. This price shall be full compensation for furnishing all materials, hauling, placing, grading, compacting, and all other necessary operations to complete the item.

Payment will be made under:

- Item P-152a Unclassified Excavation - per cubic yard
- Item P-152b Shoulder Grading - per square yard

TESTING REQUIREMENTS

- ASTM D 698 Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-pound (2.49 kg) Rammer and 12-inch (305 mm) Drop
- ASTM D 1556 Test for Density of Soil In Place by the Sand-Cone Method
- ASTM D 1557 Test for Laboratory Compaction Characteristics of Soil Using Modified Effort
- ASTM D 2167 Test for Density and Unit Weight of Soil In Place by the Rubber Balloon Method.

END OF ITEM P-152

**ITEM P-154
SUBBASE COURSE**

DESCRIPTION

154-1.1

This item shall consist of a subbase course composed of granular materials constructed on a prepared subgrade or underlying course in accordance with these specifications, and in conformity with the dimensions and typical cross section shown on the plans.

MATERIALS

154-2.1 MATERIALS.

The subbase material shall consist of hard durable particles or fragments of granular aggregates. This material will be mixed or blended with fine sand, clay, stone dust, or other similar binding or filler materials produced from approved sources. This mixture must be uniform and shall comply with the requirements of these specifications as to gradation, soil constants, and shall be capable of being compacted into a dense and stable subbase. The material shall be free from vegetable matter, lumps or excessive amounts of clay, and other objectionable or foreign substances. Pit-run material may be used, provided the material meets the requirements specified.

TABLE 1. GRADATION REQUIREMENTS

Sieve designation (square openings)	Percentage by weight passing sieves
Per ASTM C 136 and ASTM D 422	
3 inch (75.0 mm)	100
No. 10 (2.0 mm)	20-100
No. 40 (0.450 mm)	5-60
No. 200 (0.075 mm)	0-8

The portion of the material passing the No. 40 (0.450 mm) sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 when tested in accordance with ASTM D 4318.

The maximum amount of material finer than 0.02 mm in diameter shall be less than 3%.

CONSTRUCTION METHODS

154-3.1 GENERAL.

The subbase course shall be placed where designated on the plans or as directed by the Engineer. The material shall be shaped and thoroughly compacted within the tolerances specified.

Granular subbases which, due to grain sizes or shapes, are not sufficiently stable to support without movement the construction equipment, shall be mechanically stabilized to the depth necessary to provide such stability as directed by the Engineer. The mechanical stabilization shall principally include the addition of a fine-grained medium to bind the particles of the

subbase material sufficiently to furnish a bearing strength, so that the course will not deform under the traffic of the construction equipment. The addition of the binding medium to the subbase material shall not increase the soil constants of that material above the limits specified.

154-3.2 OPERATION IN PITS.

All work involved in clearing and stripping pits and handling unsuitable material encountered shall be performed by the Contractor at his/her own expense. The subbase material shall be obtained from pits or sources that have been approved. The material in the pits shall be excavated and handled in such manner that a uniform and satisfactory product can be secured.

154-3.3 PREPARING UNDERLYING COURSE.

Before any subbase material is placed, the underlying course shall be prepared and conditioned as specified. The course shall be checked and accepted by the Engineer before placing and spreading operations are started.

To protect the subgrade and to ensure proper drainage, the spreading of the subbase shall begin along the centerline of the pavement on a crowned section or on the high side of pavements with a one-way slope.

154-3.4 MATERIALS ACCEPTANCE IN EXISTING CONDITION.

When the entire subbase material is secured in a uniform and satisfactory condition and contains approximately the required moisture, such approved material may be moved directly to the spreading equipment for placing. The material may be obtained from gravel pits, stockpiles, or may be produced from a crushing and screening plant with the proper blending. The materials from these sources shall meet the requirements for gradation, quality, and consistency. It is the intent of this section of the specifications to secure materials that will not require further mixing. The moisture content of the material shall be approximately that required to obtain maximum density. Any minor deficiency or excess of moisture may be corrected by surface sprinkling or by aeration. In such instances, some mixing or manipulation may be required, immediately preceding the rolling, to obtain the required moisture content. The final operation shall be blading or dragging, if necessary, to obtain a smooth uniform surface true to line and grade.

154-3.5 PLANT MIXING.

When materials from several sources are to be blended and mixed, the subbase material shall be processed in a central or travel mixing plant. The subbase material, together with any blended material, shall be thoroughly mixed with the required amount of water. After the mixing is complete, the material shall be transported to and spread on the underlying course without undue loss of the moisture content.

154-3.5.1 MIXED IN PLACE.

When materials from different sources are to be proportioned and mixed or blended in place, the relative proportions of the components of the mixture shall be as designated by the Engineer.

The subbase material shall be deposited and spread evenly to a uniform thickness and width. Then the binder, filler or other material shall be deposited and spread evenly over the first layer. There shall be as many layers of materials added as the Engineer may direct to obtain the required subbase mixture.

When the required amount of materials have been placed, they shall be thoroughly mixed and blended by means of graders, discs, harrows, rotary tillers, supplemented by other suitable equipment if necessary. The mixing shall continue until the mixture is uniform throughout. Areas of segregated material shall be corrected by the addition of binder or filler material and by thorough remixing. Water in the amount and as directed by the Engineer shall be uniformly applied prior to and during the mixing operations, if necessary, to maintain the material at its required moisture content. When the mixing and blending has been completed, the material shall be spread in a uniform layer which, when compacted, will meet the requirements of thickness and typical cross section.

154-3.6 GENERAL METHODS FOR PLACING.

The subbase course shall be constructed in layers. Any layer shall be not less than 3 inches (75 mm) nor more than 8 inches (200 mm) of compacted thickness. The subbase material shall be deposited and spread evenly to a uniform thickness and width. The material, as spread, shall be of uniform gradation with no pockets of fine or coarse materials. The subbase, unless otherwise permitted by the Engineer, shall not be spread more than 2,000 square yards (1700 square meters) in advance of the rolling. Any necessary sprinkling shall be kept within this limit. No material shall be placed in snow or on a soft, muddy, or frozen course.

When more than one layer is required, the construction procedure described herein shall apply similarly to each layer.

During the placing and spreading, sufficient caution shall be exercised to prevent the incorporation of subgrade, shoulder, or foreign material in the subbase course mixture.

154-3.7 FINISHING AND COMPACTING.

After spreading or mixing, the subbase material shall be thoroughly compacted by rolling and sprinkling, when necessary. Sufficient rollers shall be furnished to adequately handle the rate of placing and spreading of the subbase course.

The field density of the compacted material shall be at least 100 percent of the maximum density of laboratory specimens prepared from samples of the subbase material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with D1557. The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2922. The moisture content of the material at the start of compaction shall not be below nor more than 2 percentage points above the optimum moisture content.

When nuclear density gages are to be used for density determination, testing shall be in accordance with General Provisions 120 and ASTM D 6938.

The course shall not be rolled when the underlying course is soft or yielding or when the rolling causes undulation in the subbase. When the rolling develops irregularities that exceed 1/2 inch (12 mm) when tested with a 16-foot (4.8 m) straightedge, the irregular surface shall be loosened and then refilled with the same kind of material as that used in constructing the course and again rolled as required above.

Along places inaccessible to rollers, the subbase material shall be tamped thoroughly with mechanical or hand tampers.

Sprinkling during rolling, if necessary, shall be in the amount and by equipment approved by the Engineer. Water shall not be added in such a manner or quantity that free water will reach the underlying layer and cause it to become soft.

154-3.8 SURFACE TEST.

After the course is completely compacted, the surface shall be tested for smoothness and accuracy of grade and crown; any portion found to lack the required smoothness or to fail in accuracy of grade or crown shall be scarified, reshaped, recompact, and otherwise manipulated as the Engineer may direct until the required smoothness and accuracy is obtained. The finished surface shall not vary more than 1/2 inch (12 mm) when tested with a 16-foot (4.8 m) straightedge applied parallel with, and at right angles to, the centerline.

154-3.9 THICKNESS.

The thickness of the completed subbase course shall be determined by depth tests or sample holes taken at intervals so each test shall represent no more than 500 square yards (420 square meters). When the deficiency in thickness is more than 1/2 inch (12 mm), the Contractor shall correct such areas by scarifying, adding satisfactory mixture, rolling, sprinkling, reshaping, and finishing in accordance with these specifications. The Contractor shall replace at his/her expense the subbase material where borings are taken for test purposes.

154-3.10 PROTECTION.

Work on subbase course shall not be conducted during freezing temperature nor when the subgrade is wet. When the subbase material contains frozen material or when the underlying course is frozen, the construction shall be stopped.

154-3.11 MAINTENANCE.

Following the final shaping of the material, the subbase shall be maintained throughout its entire length by the use of standard motor graders and rollers until, in the judgment of the Engineer, the subbase meets all requirements and is acceptable for the construction of the next course.

METHOD OF MEASUREMENT

154-4.1

The yardage of subbase course to be paid for shall be the number of square yards of subbase course material placed, compacted, and accepted in the completed course. The quantity of subbase course material shall be measured in final position based upon depth tests or cores taken as directed by the Engineer, or at the rate of 1 depth test for each 500 square yards (420 square meters) of subbase course, or by means of average end areas on the complete work computed from elevations to the nearest 0.01 foot (3 mm). On individual depth measurements, thicknesses more than 1/2 inch (12 mm) in excess of that shown on the plans shall be considered as the specified thickness plus 1/2 inch (12 mm) in computing the yardage for payment. Subbase materials shall not be included in any other excavation quantities.

BASIS OF PAYMENT

154-5.1

Payment shall be made at the contract unit price per square yard for subbase course. This price shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-154 Subbase Course (18 Inches Thick) - per square yard

TESTING REQUIREMENTS

ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	Particle Size Analysis of Soils
ASTM D 698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb (2.49 kg) Rammer and 12-in (305 mm) Drop
ASTM D 1556	Density of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test for Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D 2922	Density of Soil in Place by the Nuclear Density Method
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils

END OF ITEM P-154

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ITEM P-156
TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILTATION CONTROL

DESCRIPTION

156-1.1

This item shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

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.

MATERIALS

156-2.1 GRASS.

Grass that will not compete with the grasses sown later for permanent cover shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover.

156-2.2 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.

156-2.3 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.

156-2.4 SLOPE DRAINS.

Slope drains may be constructed of pipe, fiber mats, rubble, Portland Cement Concrete, bituminous concrete, or other materials that will adequately control erosion.

156-2.5 OTHER.

All other materials shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

156-3.1 GENERAL.

In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

156-3.2 SCHEDULE.

Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

156-3.3 AUTHORITY OF ENGINEER.

The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to 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.

156-3.4 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 accepted schedule. 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 is likely to be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, temporary erosion control measures may be required between successive construction stages.

The Engineer will 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 in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

In the event that 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 are ordered by the Engineer, such work shall be performed by the Contractor at his/her own expense.

The Engineer may increase or decrease the area of erodible earth material to be exposed at one time as determined by analysis of project conditions.

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

Whenever construction equipment must cross watercourses at frequent intervals, and such crossings will adversely affect the sediment levels, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto.

METHOD OF MEASUREMENT

156-4.1

Temporary erosion and pollution control work shall not be measured for payment. Temporary erosion and pollution control work required which is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls will be performed as scheduled or ordered by the Engineer.

- a. Temporary benches, dikes, dams, and sediment basins will be paid for under this item and shall be incidental for excavation performed, including necessary cleaning of sediment basins, and the cubic yard of embankment placed at the direction of the Engineer, in excess of plan lines and elevations.

156-4.2

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 with costs included in the contract prices bid for the items to which they apply.

BASIS OF PAYMENT

156-5.1

No direct payment shall be made for clearing and grubbing. The cost of furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete the item shall be incidental.

No direct payment shall be made for temporary slope drains, benches, dikes, dams and sediment basins. The cost of furnishing all materials and for all labor, equipment, tools and incidentals necessary to complete the item shall be incidental.

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.

END OF ITEM P-156

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**ITEM P-304
CEMENT-TREATED BASE COURSE**

DESCRIPTION

304-1.1

This item shall consist of a cement-treated base (CTB) course composed of mineral aggregate and cement, uniformly blended and mixed with water. The mixed material shall be spread and shaped with a mechanical spreader, and compacted with rollers in accordance with these specifications and in conformance to the lines, grades, dimensions, and cross-sections shown on the plans.

MATERIALS

304-2.1 AGGREGATE.

The aggregate shall be select granular materials, comprised of crushed or uncrushed gravel and/or stone, or recycled crushed and graded Portland Cement Concrete (PCC). The material shall be free of roots, sod, and weeds. The crushed or uncrushed aggregate shall consist of hard, durable particles of accepted quality, free from an excess of soft, flat, elongated, or disintegrated pieces, and objectionable matter. The method used in producing the aggregate shall be such that the finished product is as consistent as practicable. All stones and rocks of inferior quality shall be wasted. When recycled PCC is used as the aggregate, it must meet the requirements for virgin aggregate.

The percentage of wear of the crushed aggregate retained on the No. 4 sieve shall not be greater than 40 percent when tested in accordance with ASTM C 131. The sodium sulfate soundness loss shall not exceed 10 percent, or the magnesium sulfate soundness loss shall not exceed 15 percent, after five cycles, when tested in accordance with ASTM C 88.

When tested in accordance with ASTM C 136, the aggregate shall conform to the gradations shown in Table 1. An aggregate blend that meets the requirements of Table 1 shall be selected by the Contractor and used in the final mix design. The final aggregate blend shall be well graded from coarse to fine within the limits designated in the table and shall not vary from the low limit on one sieve to the high limit on adjacent sieves, or vice versa. The portion of final aggregate blend passing the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 when tested in accordance with ASTM D 4318.

Table 1. Aggregate Gradation for CTB Material

Sieve Size	Percentage by Weight Passing Sieves	
	Gradation A	Gradation B
2 inch	100 ¹	100 ¹
No. 4	45 - 100	55 - 100
No. 10	37 - 80	45 - 100
No. 40	15 - 50	25 - 80
No. 80	0 - 25	10 - 35
¹ Maximum nominal size of aggregate is 1 inch.		

All aggregate samples required for testing shall be furnished by the Contractor at the expense of the Contractor. Sampling shall be performed by the Contractor in accordance with ASTM D 75.

304-2.2 CEMENT. Cement shall conform to the requirements of **ASTM C 150 Type I or II.**

304-2.3 CEMENTITIOUS ADDITIVES.

Pozzolan and ground granulated blast furnace (GGBF) slag may be added to the CTB mix. If used, each material must meet the following requirements:

- a. Pozzolan. Pozzolan materials must meet the requirements of ASTM C 618, Class C, F, or N with the exception of loss of ignition, where the maximum shall be less than 6 percent for Class F or N. The supplementary optional chemical and physical properties of Tables 1A and 2A contained in ASTM C 618 shall apply.
- b. GGBF Slag. Slag shall conform to ASTM C 989, Grade 80, 100, or 120.

304-2.4 WATER.

Water used in mixing or curing shall be clean and free of oil, salt, acid, alkali, sugar, vegetable, or other deleterious substances injurious to the finished product. Water shall be tested in accordance with the requirements of AASHTO T 26. Water known to be of potable quality may be used without testing.

304-2.5 CURING MATERIALS.

Curing materials shall conform to the requirements provided below, as defined by the type of pavement surface to be placed on top of the CTB layer.

304-2.5.1 PORTLAND CEMENT CONCRETE (PCC) PAVEMENT.

For curing CTB placed under PCC pavement, use white-pigmented, liquid membrane-forming compound conforming to ASTM C 309, Type 2, Class A or Class B (wax-based).

304-2.5.2 HOT MIX ASPHALT (HMA) PAVEMENT.

For curing CTB placed under HMA pavement, use emulsified asphalt conforming to ASTM C 977 or ASTM D 2397 (Table 2).

Table 2 Emulsified Asphalt Curing Material

Type and Grade	Specification	Application Temperature	
Emulsified Asphalt			
RS-1, SS-1	ASTM D 977	75 – 130 °F	25 - 55 °C
CRS-1	ASTM D 2397	75 - 130 °F	25 - 55 °C

304-2.6 SAND BLOTTER.

If emulsified asphalt is used as a curing material, sand shall be applied, when required, for the prevention of pick-up of emulsion curing materials. The sand material shall be clean, dry, and non-plastic.

COMPOSITION OF MIXTURE

304-3.1 GENERAL.

The CTB material shall be composed of a mixture of aggregate, Portland cement and water. Flyash or GGBF slag may be used as a partial replacement for Portland cement.

304-3.2 MIX DESIGN.

The mix design shall use a cement content that, when tested in the laboratory according to ASTM D 1633, produces a 7-day compressive strength meeting the following requirements:

- a. For CTB placed under PCC pavement: 500 psi minimum and 1,000 psi maximum.
- b. For CTB placed under HMA pavement: 750 psi minimum and 1,000 psi maximum.

The mix design shall include a complete list of materials, including type, brand, source, and amount of cement, fine aggregate, coarse aggregate, water, and cementitious additives, if used. It shall also contain the 7-day compressive strength test results and the results of the wet-dry and/or freeze-thaw tests.

Should a change be made in aggregate sources or type of cement, or if cementitious additives are added or deleted from the mix, production of the CTB mix shall be stopped and a new mix design shall be submitted.

304-3.3 SUBMITTALS. At least **20** days prior to the placement of the CTB, the Contractor shall submit certified test reports to the Engineer for those materials proposed for use during construction, as well as the mix design information for the CTB material. Tests older than 6 months shall not be used. The certification shall show the ASTM or AASHTO specifications or tests for the material, the name of the company performing the tests, the date of the tests, the test results, and a statement that the material did or did not comply with the applicable specifications. The submittal package shall include the following:

- a. Sources of materials, including aggregate, cement, cementitious additives, curing, and bond-breaking materials.
- b. Physical properties of the aggregates, cement, cementitious additives, curing, and bond-breaking materials.
- c. Mix design
 - Mix identification number
 - Aggregate gradation
 - Cement content
 - Water content
 - Cementitious materials content
- d. Laboratory test results
 - Compaction and strength testing procedures
 - Laboratory compaction characteristics (maximum dry density and optimum moisture content)
 - Compressive strength at 7 days
 - Wet-dry and/or freeze-thaw weight loss, if applicable

No CTB material shall be placed until the submittal is accepted in writing by the Engineer. During production, the Contractor shall submit batch tickets for each delivered load.

EQUIPMENT

All equipment necessary to mix, transport, place, compact, and finish the CTB material shall be furnished by the Contractor. The equipment shall be inspected and approved by the Engineer at the job site prior to the start of construction operations.

304-4.1 MIXING.

The mixer shall be a batch or continuous-flow type stationary mixer and shall be equipped with calibrated metering and feeding devices that introduce the aggregate, cement, water, and cementitious additives (if used) into the mixer in the specified quantities. If necessary, a screening device shall be used to remove oversized material greater than 2 inch from the raw aggregate feed prior to mixing.

Free access to the plant must be provided at all times for inspection of the plant's equipment and operation and for sampling the CTB mixture and its components, as deemed necessary by the Engineer.

304-4.2 HAULING.

The mixed CTB material shall be transported from the plant to the job site in trucks or other hauling equipment having beds that are smooth, clean, and tight. Truck bed covers shall be provided and used to protect the CTB from rain. CTB material that becomes wet during transport shall be subject to rejection.

304-4.3 PLACING.

CTB material shall be placed using a mechanical spreader or a machine capable of receiving, spreading, and shaping the mixture without segregation into a uniform layer or lift. The equipment shall be equipped with a strike-off plate capable of being adjusted to the specified layer thickness. It shall also be equipped with two end gates or cut off plates, so that the CTB may be spread in widths varying up to lane width.

304-4.4 COMPACTION.

Compaction of the CTB layer shall be accomplished using one or a combination of the following pieces of equipment:

- Tamping or grid roller
- Steel-wheeled roller
- Vibratory roller
- Pneumatic-tire roller
- Vibrating plate compactor (for areas inaccessible to rollers)

The number, type, and weight of rollers and/or compactors shall be sufficient to compact the mixture to the required density.

304-4.5 FINISHING.

Final trimming of the compacted CTB to meet surface requirements shall be accomplished using a self-propelled grader or trimming machine, with a mold board cutting edge, which is at least 12 foot wide and is automatically controlled by sensors in conjunction with an independent grade control from a taut stringline. Stringline will be required on both sides of the sensor controls for the pilot lane. For all other lanes, a single stringline on the outside and grade matching with previously completed adjacent lanes is permissible.

CONSTRUCTION METHODS

304-5.1 WEATHER LIMITATIONS.

304-5.1.1 COLD WEATHER.

The CTB material shall not be mixed or placed while the air temperature is below 40°F or when conditions indicate that the temperature may fall below 35°F within 24 hours. The CTB shall not be placed on frozen surfaces.

304-5.1.1 RAIN.

The CTB may not be placed when rainfall is occurring. If an unexpected rain event occurs during placement, the layer should be quickly compacted. CTB material that becomes wet by rain during transport or placement shall be evaluated by the Engineer, and may be subject to rejection.

304-5.2 PREPARATION OF UNDERLYING COURSE.

The underlying course shall be checked by the Engineer before placing and spreading operations are started, in order to ensure that it is free of any ruts, depressions, or bumps and is finished to the correct grade. Any ruts or soft yielding places caused by improper drainage conditions, hauling, or any other cause, shall be corrected before the CTB mixture is placed thereon. The underlying course shall be wetted in advance of placing the CTB layer. The final prepared grade prior to placing the CTB should be in a firm and moist condition free of frost. Use of chemicals to eliminate frost will not be permitted.

To ensure proper drainage, placement of the base shall begin along the centerline of the pavement on a crowned section or on the highest elevation contour of a pavement with variable cross slope.

304-5.3 GRADE CONTROL.

Grade control between the edges of the CTB shall be accomplished at intervals of 50 feet or less on the longitudinal grade and at 25 feet or less on the transverse grade.

304-5.4 HANDLING, MEASURING, AND BATCHING.

The continuous flow central plant site, layout, equipment, and provisions for transporting material shall assure a continuous supply of material to the work. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials.

Aggregates that are segregated or mixed with earth or foreign material will not be accepted.

Continuous flow plants shall be equipped with feeders to proportion aggregates and bulk cement, by weight, automatically and accurately. When bulk cement is used, the Contractor shall use a suitable method of handling the cement from weighing hopper to transporting container or into the batch itself for transportation to the mixer, such as a chute, boot or other device, to prevent loss of cement. The device shall be arranged to provide positive assurance that the cement content specified is present in each batch.

304-5.5 MIXING.

Aggregate and cement may be proportioned either by weight or volume, and shall be mixed sufficiently to prevent the forming of cement balls when water is added. The mixing time shall be that which is required to secure an intimate, uniform mixture of aggregate, cement, water, and pozzolan (if used). The minimum mixing time will be based on the uniformity and consistency of the mixture.

304-5.6 PLACING.

The CTB mixture shall be deposited on the moistened subgrade or subbase and spread into a uniform layer of such width and thickness that, following compaction and trimming, conforms to the required grade and cross-section. The Contractor may install the CTB layer in single or multiple compacted lifts; however, each compacted lift must be no greater than 6 inches thick. In multi-lift construction, the surface of the compacted lift shall be kept moist until covered with the next lift. Successive lifts shall be placed and compacted so that the required total depth of the CTB layer is completed within 12 hours.

A single spreader may be used, provided it is capable of placing a uniform, full-depth layer of material across the full width of the base in one pass. Otherwise, two or more spreaders will be required, and shall be operated so that spreading progresses along the full width of the base in a uniform manner.

304-5.7 COMPACTION.

Immediately upon completion of the spreading operations, the CTB material shall be thoroughly compacted using approved compaction equipment. At the start of compaction, the moisture content shall be within 2 percentage points of the specified optimum moisture.

304-5.8 FINISHING.

Upon completion of compaction, the surface of the CTB layer shall be shaped to the specified lines, grades, and cross-section. During the finishing process, the surface shall be kept moist by means of fog-type sprayers. Compaction and finishing shall be done in such a manner as to produce a smooth, dense surface, free of ruts, cracks, ridges, and loose material. All placement, compaction, and finishing operations shall be completed within 2 hours from the start of mixing. Material not completed within the 2-hour time limit shall be removed and replaced at the Contractor's expense.

CTB layer limits that extend beyond the edges of the new PCC surface course shall be rolled down or shaped in such a manner that the drainage is away from the new PCC surface course edge.

304-5.9 CONSTRUCTION JOINTS.

At the end of each day's construction, a transverse construction joint shall be formed that is a true vertical face (perpendicular to the centerline) and is free of loose material.

Longitudinal construction joints (parallel to the centerline) shall be formed to a consistent, well-defined near vertical edge that is free of loose material. The longitudinal joints shall be located such that there is a 2 foot minimum offset from planned joints in any overlying layer.

While forming construction joints, the Contractor shall make sure the material in the joint area is adequately compacted and that the joints are finished level and even with the remainder of the CTB layer.

304-5.10 CURING.

The compacted and finished CTB shall be cured with the approved curing agents as soon as possible, and in no case later than 2 hours after completion of the finishing operations. The layer shall be kept moist using a moisture-retaining cover or a light application of water until the curing material is applied.

When asphalt emulsion is used as the curing agent, the entire surface of the CTB layer shall be uniformly sprayed with the emulsion at a rate of between 0.15 and 0.30 gal/sq yd; the exact temperature and rate of application being that required to achieve complete and uniform coverage without runoff. Should it be necessary for construction equipment or other traffic to use the asphalt-covered surface, sufficient sand blotter cover shall be applied to prevent pick-up.

The curing seal shall be maintained and protected until the pavement is placed. Should the surface of the finished CTB and/or the curing seal become damaged, additional curing material shall be applied at the time it is damaged or when the damage is first observed.

304-5.11 PROTECTION.

The Contractor shall protect the finished CTB against traffic. Completed portions of the CTB layer can be opened immediately to low-speed traffic and to construction equipment, provided the curing material is not damaged and the CTB is sufficiently stable to resist permanent deformation. Should the CTB be damaged, it shall be replaced using full-depth patches, and sprayed with the selected curing compound as described above. The CTB shall also be protected from freezing at all times.

304-5.12 BOND-BREAKER. (DELETED)

MATERIAL ACCEPTANCE

304-6.1 ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing, with the exception of thickness determination, necessary to determine conformance with the requirements specified in this section will be performed by the Engineer. The Contractor shall provide the required CTB samples during construction for acceptance testing purposes. The samples shall be taken in the presence of the Engineer.

Testing organizations performing these tests shall meet the requirements of ASTM D 3666. All test equipment in Contractor-furnished laboratories shall be calibrated by the testing organization prior to the start of operations.

The CTB layer shall be tested for density, thickness, grade, and surface tolerance on a lot basis, with a lot consisting of one of the following:

- One day's production not to exceed 2,000 sq yd.
- A half day's production, where a day's production consists of 2,000 to 4,000 sq yd.

Each lot shall be divided into four (4) equal sublots. Within each subplot, one (1) density test, one (1) thickness measurement, and continuous surface straightedge tests (surface tolerance testing) shall be performed, as described below. Sampling locations shall be determined by the Engineer in accordance with the random sampling procedures contained in ASTM D 3665.

In the event that only three (3) sublots are produced, the three sublots shall constitute a complete lot. If one (1) or two (2) sublots are produced for the same reason, they shall be incorporated into the next or previous lot, and the total number of sublots shall be used in the acceptance criteria calculation.

End-of-production sublots (that is, sublots associated with the final placement of CTB for the project and are less than a complete lot) shall be handled as follows:

- Three (3) sublots shall constitute a lot.
- One (1) or two (2) sublots shall be incorporated into the previous lot.

304-6.1.1 DENSITY TESTING.

CTB samples shall be taken from each subplot and used to create laboratory test specimens representing the various sublots. The specimens shall be compacted and tested for density and moisture content in accordance with ASTM D 558. Using the density results for each subplot comprising a lot, an average density for the lot shall be determined, which will serve as the basis for acceptance of the lot with regard to density.

Within each subplot in the field, one (1) in-place density test shall be performed in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938. The location of the test shall be randomly selected in accordance with the procedures contained in ASTM D 3665. The in-place density results for each subplot comprising the lot shall then be averaged and compared with the corresponding average lot density. Acceptance criteria for CTB density are provided in paragraph 304-6.2.1.

304-6.1.2 THICKNESS TESTING.

The CTB shall be tested for thickness using the same lot and subplot designations established for density testing. After 3 days of curing, one (1) 4 inch diameter core per subplot shall be obtained from a random location, as identified using the procedures contained in ASTM D 3665. The thickness of each sampled core shall be determined using the caliper measurement procedures provided in ASTM C 174. The average thickness for the lot shall be determined using the individual subplot core thicknesses. Acceptance criteria for CTB thickness are provided in paragraph 304-6.2.2. At all locations where cores have been drilled, the resulting core holes shall be filled by the Contractor with CTB, HMA, or non-shrink grout.

304-6.1.3 GRADE TESTING.

The elevations of the finished CTB shall be surveyed every 25 feet on both sides of the CTB lane as soon as it has hardened sufficiently. Acceptance criteria for CTB grade are provided in paragraph 306-6.2.3.

304-6.1.4 SURFACE TOLERANCE TESTING.

As soon as the CTB has hardened sufficiently, it shall be tested for surface tolerance with a 16 foot straightedge or other approved measuring device.

304-6.2 ACCEPTANCE CRITERIA.

Acceptance of CTB will be based on density, thickness, grade, and surface tolerance, as described in the paragraphs below.

304-6.2.1 DENSITY REQUIREMENTS.

With respect to density, each lot of compacted material will be accepted without adjustment if the average in-place density of the lot is equal to or greater than 98 percent of the average density determined for the lot. Each lot of compacted CTB shall be accepted and payment adjusted in accordance with Table 3.

Table 3 Sliding Pay Scale Factors For Density

Average Dry Density (%)	Payment (%)
98.0 and greater	100
97.0 - 97.9	95
96.0 - 96.9	90
95.0 - 95.9	75
Less than 95.0	Reject

If the average density is below 95 percent, the lot will be rejected and shall be removed and replaced at the Contractor's expense. In multi-layer construction, density shall be tested for each lift, and all lifts within a rejected lot shall be removed and replaced. No payment shall be made for removed lifts. Replacement lifts shall be paid in accordance with this section.

304-6.2.2 THICKNESS REQUIREMENTS.

The completed thickness shall be as shown on the plans. When the average lot thickness is not deficient by more than $\frac{1}{2}$ inch from the plan thickness, full payment shall be made. If the average lot thickness is deficient by more than 1 inch, it shall be removed and replaced at the Contractor's expense. When such measurement is deficient by more than $\frac{1}{2}$ inch but less than 1 inch from the plan thickness, one additional core shall be taken at random from each subplot within the lot. The thickness of these additional cores shall be determined as indicated in paragraph 304-6.1.2. A new average lot thickness shall be recomputed based on these additional cores and the original cores taken from each subplot. If the recomputed average lot thickness is not deficient by more than $\frac{1}{2}$ inch from the plan thickness, full payment shall be made. If the average lot thickness is deficient by more than $\frac{1}{2}$ inch from the plan thickness, the entire lot shall be removed and replaced at the Contractor's expense or shall be permitted to remain in-place at an adjusted payment of 75 percent of the contract unit price.

When the measured thickness is more than that indicated on the plans, it will be considered as conforming to the requirements, provided the surface of the completed CTB layer is within the established grade and surface tolerance requirements.

304-6.2.3 GRADE REQUIREMENTS.

When the completed surface is higher than $\frac{1}{2}$ inch above the grade shown in the plans, the surface shall be trimmed, at the Contractor's expense, with an approved grinding machine to an elevation that falls within a tolerance of $\frac{1}{4}$ inch or less.

304-6.2.4 SURFACE TOLERANCE REQUIREMENTS.

The finished surface shall not vary more than $\frac{3}{8}$ inch when tested with a 12 foot straightedge applied parallel with, or at right angles to, the centerline of the CTB area. Areas in the CTB showing high spots greater than $\frac{3}{8}$ inch over 12 feet shall be marked and immediately trimmed with an approved grinding machine. Such trimming shall be at the Contractor's expense.

METHOD OF MEASUREMENT

304-7.1 CEMENT-TREATED BASE COURSE.

The quantity of cement-treated base course to be paid for will be determined by measurement of the number of square yard of CTB actually constructed and accepted by the Engineer as complying with the plans and specifications.

BASIS OF PAYMENT

304-8.1 CEMENT-TREATED BASE COURSE.

Payment shall be made at the contract unit price per square yard for cement-treated base course. This price shall be full compensation for furnishing all materials, including cement; for all preparation, manipulation, placing, and curing of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Each lot of CTB material will be accepted for density at the full contract price adjusted in accordance with Table 3 in paragraph 304-6.2.1.

Payment will be made under:

Item P-304 Cement-treated Base Course (4 Inches Thick) - per square yard

TESTING REQUIREMENTS

ASTM C 88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 131	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM C 174	Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM D 75	Sampling Aggregates
ASTM D 558	Moisture-Density Relations of Soil-Cement Mixtures
ASTM D 559	Test Methods for Wetting & Drying Compacted Soil Cement Mixtures
ASTM D 560	Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
ASTM D 1556	Density of Soil in Place by the Sand-Cone Method
ASTM D 1633	Compressive Strength of Molded Soil-Cement Cylinders
ASTM D 2167	Density of Soil in Place by the Rubber-Balloon Method
ASTM D 6938	In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods
ASTM D 3665	Random Sampling of Paving Materials
ASTM D 3666	Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM C 150	Portland Cement
ASTM C 309	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 595	Blended Hydraulic Cements
ASTM C 618	Coal Flyash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 989	Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 977	Emulsified Asphalt
ASTM D 2397	Cationic Emulsified Asphalt

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**ITEM P-401
PLANT MIX BITUMINOUS PAVEMENTS**

DESCRIPTION

401-1.1

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

MATERIALS

401-2.1 AGGREGATE.

Aggregates shall consist of crushed stone, crushed gravel, or crushed slag with or without natural sand or other inert finely divided mineral aggregate. The portion of combined materials retained on the No. 4 sieve is coarse aggregate. The portion of combined materials passing the No. 4 sieve and retained on the No. 200 sieve is fine aggregate, and the portion passing the No. 200 sieve is mineral filler.

a. Coarse Aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from adherent films of matter that would prevent thorough coating and bonding with the bituminous material and be free from organic matter and other deleterious substances. The percentage of wear shall not be greater than 40 percent when tested in accordance with ASTM C 131. The sodium sulfate soundness loss shall not exceed 10 percent, or the magnesium sulfate soundness loss shall not exceed 13 percent, after five cycles, when tested in accordance with ASTM C 88.

Aggregate shall contain at least 70 percent by weight of individual pieces having two or more fractured faces and **85** percent by weight having at least one fractured face. The area of each face shall be equal to at least 75 percent of the smallest midsectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces. Fractured faces shall be obtained by crushing.

The aggregate shall not contain more than a total of 8 percent, by weight, of flat particles, elongated particles, and flat and elongated particles, when tested in accordance with ASTM D 4791 with a value of 5:1.

Slag shall be air-cooled, blast furnace slag, and shall have a compacted weight of not less than 70 pounds per cubic foot when tested in accordance with ASTM C 29.

b. Fine Aggregate. Fine aggregate shall consist of clean, sound, durable, angular shaped particles produced by crushing stone, slag, or gravel that meets the requirements for wear and soundness specified for coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. The fine aggregate, including any blended material for the fine aggregate, shall have a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested in accordance with ASTM D 4318.

Natural (nonmanufactured) sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this specification. If used, the natural sand shall meet the requirements of ASTM D 1073 and shall have a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested in accordance with ASTM D 4318.

The aggregate shall have sand equivalent values of 45 or greater when tested in accordance with ASTM D 2419.

c. Sampling. ASTM D 75 shall be used in sampling coarse and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler.

401-2.2 MINERAL FILLER.

If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D 242.

401-2.3 BITUMINOUS MATERIAL.

Bituminous material shall conform to the following requirements: AASHTO M320 Performance Grade (PG) 70-22.

The Contractor shall furnish vendor's certified test reports for each lot of bituminous material shipped to the project. The vendor's certified test report for the bituminous material can be used for acceptance or tested independently by the Engineer.

401-2.4

PRELIMINARY MATERIAL ACCEPTANCE.

Prior to delivery of materials to the job site, the Contractor shall submit certified test reports to the Engineer for the following materials:

a. Coarse Aggregate.

- (1) Percent of wear.
- (2) Soundness.
- (3) Unit weight of slag.
- (4) Percent fractured faces.

b. Fine Aggregate.

- (1) Liquid limit.
- (2) Plasticity index.
- (3) Sand equivalent.

c. Mineral Filler.

d. Bituminous Material. Test results for bituminous material shall include temperature/viscosity charts for mixing and compaction temperatures.

The certification(s) shall show the appropriate ASTM test(s) for each material, the test results, and a statement that the material meets the specification requirement.

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

401-2.5 ANTI-STRIPPING AGENT.

Any anti-stripping agent or additive if required shall be heat stable, shall not change the asphalt cement viscosity beyond specifications, shall contain no harmful ingredients, shall be added in recommended proportion by approved method, and shall be a material approved by the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 COMPOSITION OF MIXTURE.

The bituminous plant mix shall be composed of a mixture of well-graded aggregate, filler and anti-strip agent if required, and bituminous material. The several aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 JOB MIX FORMULA.

No bituminous mixture for payment shall be produced until a job mix formula has been approved in writing by the Engineer. The bituminous mixture shall be designed using procedures contained in Chapter 5, MARSHALL METHOD OF MIX DESIGN, of the Asphalt Institute's Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete, sixth edition.

The design criteria in Table 1 are target values necessary to meet the acceptance requirements contained in paragraph 401-5.2b. The criteria is based on a production process which has a material variability with the following standard deviations:

Stability (lbs.) = 270
Flow (0.01 inch) = 1.5
Air Voids (%) = 0.65

If material variability exceeds the standard deviations indicated, the job mix formula and subsequent production targets shall be based on a stability greater than shown in Table 1, and the flow and air voids shall be targeted close to the mid-range of the criteria in order to meet the acceptance requirements.

Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D 4867, shall not be less than 75. Anti-stripping agent shall be added to the asphalt, as necessary, to produce a TSR of not less than 75. If an antistrip agent is required, it will be provided by the Contractor at no additional cost to the Owner.

The job mix formula shall be submitted in writing by the Contractor to the Engineer at least 10 days prior to the start of paving operations and shall include as a minimum:

- a. Percent passing each sieve size for total combined gradation, individual gradation of all aggregate stockpiles and percent by weight of each stockpile used in the job mix formula.
- b. Percent of asphalt cement.
- c. Asphalt performance, viscosity or penetration grade, and type of modifier if used.

- d.** Number of blows of hammer compaction per side of molded specimen.
- e.** Mixing temperature.
- f.** Compaction temperature.
- g.** Temperature of mix when discharged from the mixer.
- h.** Temperature-viscosity relationship of the asphalt cement.
- i.** Plot of the combined gradation on the Federal Highway Administration (FHWA) 45 power gradation curve.
- j.** Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content.
- k.** Percent natural sand.
- l.** Percent fractured faces.
- m.** Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- n.** Tensile Strength Ratio (TSR).
- o.** Antistrip agent (if required).
- p.** Date the job mix formula was developed.

The Contractor shall submit to the Engineer the results of verification testing of three (3) asphalt samples prepared at the optimum asphalt content. The average of the results of this testing shall indicate conformance with the job mix formula requirements specified in Tables 1, 2 and 3.

When the project requires asphalt mixtures of differing aggregate gradations, a separate job mix formula and the results of job mix formula verification testing must be submitted for each mix.

The job mix formula for each mixture shall be in effect until a modification is approved in writing by the Engineer. Should a change in sources of materials be made, a new job mix formula must be submitted within 90 days and approved by the Engineer in writing before the new material is used. After the initial production job mix formula(s) has/have been approved by the Engineer and a new or modified job mix formula is required for whatever reason, the subsequent cost of the Engineer's approval of the new or modified job mix formula will be borne by the Contractor. There will be no time extension given or considerations for extra costs associated with the stoppage of production paving or restart of production paving due to the time needed for the Engineer to approve the initial, new or modified job mix formula.

TABLE 1. MARSHALL DESIGN CRITERIA	
Test Property	Pavements Designed for Aircraft Gross Weights of 60,000 Lbs. or More or Tire Pressures of 100 Psi or More
Number of Blows	75
Stability, pounds	2150
Flow, 0.01 in.	10-14
Air Voids (percent)	2.8-4.2
Percent Voids in Mineral Aggregate (minimum)	See Table 2

TABLE 2. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Maximum Particle Size		Minimum Voids in Mineral Aggregate, percent
in.	mm	Percent
½	12.5	16
¾	19.0	15
1	25.0	14
1-½	37.5	13

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 3 when tested in accordance with ASTM C 136 and C 117.

The gradations in Table 3 represent the limits that shall determine the suitability of aggregate for use from the sources of supply. The aggregate, as selected (and used in the JMF), shall have a gradation within the limits designated in Table 3 and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine.

Deviations from the final approved mix design for bitumen content and gradation of aggregates shall be within the action limits for individual measurements as specified in paragraph 401-6.5a. The limits still will apply if they fall outside the master grading band in Table 3.

The maximum size aggregate used shall not be more than one-half of the thickness of the course being constructed except where otherwise shown on the plans or ordered by the Engineer.

TABLE 3. AGGREGATE - BITUMINOUS PAVEMENTS	
Sieve Size	Percentage by Weight Passing Sieves
	$\frac{3}{4}$ " max
1- $\frac{1}{2}$ in.	--
1 in.	--
$\frac{3}{4}$ in.	100
$\frac{1}{2}$ in.	79-99
$\frac{3}{8}$ in.	68-88
No. 4	48-68
No. 8	33-53
No. 16	20-40
No. 30	14-30
No. 50	9-21
No. 100	6-16
No. 200	3-6
Asphalt percent:	5.0-7.5
Stone or Gravel Slag	6.5-9.5

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute Manual Series No. 2 (MS-2), Chapter 3.

401-3.3 RECYCLED ASPHALT CONCRETE. (DELETED)

401-3.4 TEST SECTION.

Prior to full production, the Contractor shall prepare and place a quantity of bituminous mixture according to the job mix formula. The amount of mixture shall be sufficient to construct a test section 300 feet long and 20 feet wide, placed in two lanes, with a longitudinal cold joint, and shall be of the same depth specified for the construction of the course which it represents. A cold joint is an exposed construction joint at least 4 hours old or whose mat has cooled to less than 160°F. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

THE TEST SECTION SHALL BE EVALUATED FOR ACCEPTANCE AS A SINGLE LOT IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA IN PARAGRAPH 401-5.1 AND 401-6.3. THE TEST SECTION SHALL BE DIVIDED INTO EQUAL SUBLOTS. AS A MINIMUM THE TEST SECTION SHALL CONSIST OF 3 SUBLOTS.

The test section shall be considered acceptable if; 1) stability, flow, mat density, air voids, and joint density are 90 percent or more within limits, 2) gradation and asphalt content are within the action limits specified in paragraphs 401-6.5a and 5b, and 3) the voids in the mineral aggregate are within the limits of Table 2.

If the initial test section should prove to be unacceptable, the necessary adjustments to the job mix formula, plant operation, placing procedures, and/or rolling procedures shall be made.

A second test section shall then be placed. If the second test section also does not meet specification requirements, both sections shall be removed at the Contractor's expense. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. Any additional sections that are not acceptable shall be removed at the Contractor's expense. Full production shall not begin until an acceptable section has been constructed and accepted in writing by the Engineer. Once an acceptable test section has been placed, payment for the initial test section and the section that meets specification requirements shall be made in accordance with paragraph 401-8.1.

Job mix control testing shall be performed by the Contractor at the start of plant production and in conjunction with the calibration of the plant for the job mix formula. If aggregates produced by the plant do not satisfy the gradation requirements or produce a mix that meets the JMF. It will be necessary to reevaluate and redesign the mix using plant-produced aggregates. Specimens shall be prepared and the optimum bitumen content determined in the same manner as for the original design tests.

Contractor will not be allowed to place the test section until the Contractor Quality Control Program, showing conformance with the requirements of Paragraph 401-6.1, has been approved, in writing, by the Engineer.

401-3.5 TESTING LABORATORY.

The Contractor's laboratory used to develop the job mix formula shall meet the requirements of ASTM D 3666. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the JMF must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.

CONSTRUCTION METHODS

401-4.1 WEATHER LIMITATIONS.

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

TABLE 4. BASE TEMPERATURE LIMITATIONS		
Mat Thickness	Base Temperature (Minimum)	
	Deg. F	Deg. C
3 in. (7.5 cm) or greater	40	4
Greater than 1 in. (2.5 cm) but less than 3 in. (7.5 cm)	45	7
1 in. (2.5 cm) or less	50	10

401-4.2 BITUMINOUS MIXING PLANT.

Plants used for the preparation of bituminous mixtures shall conform to the requirements of ASTM D 995 with the following changes:

a. Requirements for All Plants.

(1) Truck Scales. The bituminous mixture shall be weighed on approved scales furnished by the Contractor, or on certified public scales at the Contractor's expense. Scales shall be inspected and sealed as often as the Engineer deems necessary to assure their accuracy. Scales shall conform to the requirements of the General Provisions, Section 90-01.

In lieu of scales, and as approved by the Engineer, asphalt mixture weights may be determined by the use of an electronic weighing system equipped with an automatic printer that weighs the total paving mixture. Contractor must furnish calibration certification of the weighing system prior to mix production and as often thereafter as requested by the Engineer.

(2) Testing Facilities. The Contractor shall provide laboratory facilities at the plant for acceptance testing and the Contractor's quality control testing. The acceptance testing company will always have priority in the use of the laboratory. The lab shall have sufficient space and equipment so that both testing representatives (Engineer's and Contractor's) can operate efficiently. The lab shall also meet the requirements of ASTM D 3666.

The plant testing laboratory shall have a floor space area of not less than 150 square feet, with a ceiling height of not less than 7-½ feet. The laboratory shall be weather tight, sufficiently heated in cold weather, air-conditioned in hot weather to maintain temperatures for testing purposes of 70 degrees F +/- 5 degrees F. The plant testing laboratory shall be located on the plant site to provide an unobstructed view, from one of its windows, of the trucks being loaded with the plant mix materials.

Laboratory facilities shall be kept clean, and all equipment shall be maintained in proper working condition. The Engineer shall be permitted unrestricted access to inspect the Contractor's laboratory facility and witness quality control activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

As a minimum, the plant testing laboratory shall have:

- (a)** Adequate artificial lighting
- (b)** Electrical outlets sufficient in number and capacity for operating the required testing equipment and drying samples.
- (c)** Fire extinguishers (2), Underwriter's Laboratories approved
- (d)** Work benches for testing, minimum 2-½ feet by 10 feet.
- (e)** Desk with 2 chairs
- (f)** Sanitary facilities convenient to testing laboratory
- (g)** Exhaust fan to outside air, minimum 12 inch blade diameter
- (h)** A direct telephone line and telephone including a FAX machine operating 24 hours per day, seven days per week
- (i)** File cabinet with lock for Engineer
- (j)** Sink with running water, attached drain board and drain capable of handling separate material
- (k)** Metal stand for holding washing sieves

- (l) Two element hot plate or other comparable heating device, with dial type thermostatic controls for drying aggregates
- (m) Mechanical shaker and appropriate sieves (listed in JMF, Table 3) meeting the requirements of ASTM E-11 for determining the gradation of coarse and fine aggregates in accordance with ASTM C 136
- (n) Marshall testing equipment meeting ASTM D 6926, ASTM D 6927, automatic compaction equipment capable of compacting three specimens at once and other apparatus as specified in ASTM C 127, D 2172, D 2726, and D 2041
- (o) Oven, thermostatically controlled, inside minimum 1 cubic foot
- (p) Two volumetric specific gravity flasks, 500 cc
- (q) Other necessary hand tools required for sampling and testing
- (r) Library containing contract specifications, latest ASTM volumes 4.01, 4.02, 4.03 and 4.09, AASHTO standard specification parts I and II, and Asphalt Institute Publication MS-2.
- (s) Equipment for Theoretical Specific Gravity testing including a 4,000 cc pycnometer, vacuum pump capable of maintaining 30 ml mercury pressure and a balance, 16-20 kilograms with accuracy of 0.5 grams
- (t) Extraction equipment, centrifuge and reflux types and Rotoflex equipment
- (u) A masonry saw with diamond blade for trimming pavement cores and samples
- (v) Telephone

Approval of the plant and testing laboratory by the Engineer requires all facilities and equipment to be in good working order during production, sampling and testing. Failure to provide the specified facilities shall be sufficient cause for disapproving bituminous plant operations.

The Owner shall have access to the lab and the plant whenever Contractor is in production.

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

(4) Storage Bins and Surge Bins. Use of surge and storage bins for temporary storage of hot bituminous mixtures will be permitted as follows:

- (a) The bituminous mixture may be stored in surge bins for a period of time not to exceed 3 hours.
- (b) The bituminous mixture may be stored in insulated storage bins for a period of time not to exceed 24 hours.

The bins shall be such that mix drawn from them meets the same requirements as mix loaded directly into trucks.

If the Engineer determines that there is an excessive amount of heat loss, segregation, or oxidation of the mixture due to temporary storage, no temporary storage will be allowed.

401-4.3 HAULING EQUIPMENT.

Trucks used for hauling bituminous mixtures shall have tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum products shall not

be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4 BITUMINOUS PAVERS.

Bituminous pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of bituminous plant mix material that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

The paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices that will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent.

The controls shall be capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet in length.
- b. Taut stringline (wire) set to grade.
- c. Short ski or shoe.
- d. Laser control.

If, during construction, it is found that the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued and satisfactory equipment shall be provided by the Contractor.

401-4.5 ROLLERS.

Rollers of the vibratory, steel wheel, and pneumatic-tired type shall be used. They shall be in good condition, capable of operating at slow speeds to avoid displacement of the bituminous mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition.

All rollers shall be specifically designed and suitable for compacting hot mix bituminous concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used. Depressions in pavement surfaces caused by rollers shall be repaired by the Contractor at its own expense.

The use of equipment that causes crushing of the aggregate will not be permitted.

a. Nuclear Densometer. The Contractor shall have on site a nuclear densometer during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall also supply a qualified technician during all paving operations to calibrate the nuclear densometer and obtain accurate density readings for all new bituminous concrete. These densities shall be supplied to the Engineer upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.6 PREPARATION OF BITUMINOUS MATERIAL.

The bituminous material shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the bituminous material delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325 degrees F, unless otherwise required by the manufacturer.

401-4.7 PREPARATION OF MINERAL AGGREGATE.

The aggregate for the mixture shall be heated and dried prior to introduction into the mixer. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350 degrees F when the asphalt is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.8 PREPARATION OF BITUMINOUS MIXTURE.

The aggregates and the bituminous material shall be weighed or metered and introduced into the mixer in the amount specified by the job mix formula.

The combined materials shall be mixed until the aggregate obtains a uniform coating of bitumen and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D 2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95 percent of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all bituminous mixtures upon discharge shall not exceed 0.5 percent.

401-4.9 PREPARATION OF THE UNDERLYING SURFACE.

Immediately before placing the bituminous mixture, the underlying course shall be cleaned of all dust and debris. A prime coat or tack coat shall be applied in accordance with Item P-602 or P-603, if shown on the plans.

401-4.10 LAYDOWN PLAN, TRANSPORTING, PLACING, AND FINISHING.

Prior to the placement of the bituminous mixture, the Contractor shall prepare a laydown plan for approval by the Engineer. This is to minimize the number of cold joints in the pavement. The laydown plan shall include the sequence of paving laydown by stations, width of lanes,

temporary ramp location(s), and laydown temperature. The laydown plan shall also include estimated time of completion for each portion of the work (i.e. milling, paving, rolling, cooling, etc.). Modifications to the laydown plan shall be approved by the Engineer.

The bituminous mixture shall be transported from the mixing plant to the site in vehicles conforming to the requirements of paragraph 401-4.3. Deliveries shall be scheduled so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.

For all runway, taxiway and apron pavements, Contractor shall use a stringline to place each lane of each lift of bituminous surface course. However, at the Contractor's option, Contractor shall use stringline for first lift of bituminous surface course and then survey the grade of that lift. Provided grades of that lift of bituminous surface course meet the tolerances of paragraphs 401-5.2b(6), then Contractor may place successive lifts of bituminous surface course using a long ski, or laser control per paragraph 401-4.4. However, Contractor shall survey each lift of bituminous surface course and certify to Engineer that every lot of each lift meets the grade tolerances of paragraph 401-5.2b(6) before the next lift can be placed without a stringline. If the grades of a single lot do not meet the tolerances of 401-5.2b(6), then the Contractor shall use a stringline for each entire lift. Corrective action in paragraph 401-5.2b(6) applies to the final lift of surface course; however, for multiple lift construction, the Contractor shall correct to ensure the final lift of surface course is a minimum of 1 3/4 inches and a maximum of 2 1/4 inches."

The Contractor may elect to use a material transfer vehicle to deliver mix to the paver.

Paving during nighttime construction shall require the following:

a. All paving machines, rollers, distribution trucks and other vehicles required by the Contractor for his operations shall be equipped with artificial illumination sufficient to safely complete the work.

b. Minimum illumination level shall be twenty (20) horizontal foot candles and maintained in the following areas:

- (1)** An area of 30 feet wide by 30 feet long immediately behind the paving machines during the operations of the machines.
- (2)** An area 15 feet wide by 30 feet long immediately in front and back of all rolling equipment, during operation of the equipment.
- (3)** An area 15 feet wide by 15 feet long at any point where an area is being tack coated prior to the placement of pavement.

c. As partial fulfillment of the above requirements, the Contractor shall furnish and use, complete artificial lighting units with a minimum capacity of 3,000 watt electric beam lights, affixed to all equipment in such a way to direct illumination on the area under construction.

d. In addition, the Contractor shall furnish adequate illumination in the work area.

The initial placement and compaction of the mixture shall occur at a temperature suitable for obtaining density, surface smoothness, and other specified requirements but not less than 250 degrees F.

Edges of existing bituminous pavement abutting the new work shall be saw cut and carefully removed as shown on the drawings and painted with bituminous tack coat before new material is placed against it.

Upon arrival, the mixture shall be placed to the full width by a bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of eight (8) feet except where edge lanes require less width to complete the area. Additional screed sections shall not be attached to widen paver to meet the minimum lane width requirements specified above unless additional auger sections are added to match. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course.

Transverse joints in adjacent lanes shall be offset a minimum of 10 feet.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools. Areas of segregation in the surface course, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of 2 inches deep. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet long.

401-4.11 COMPACTION OF MIXTURE.

After placing, the mixture shall be thoroughly and uniformly compacted by power rollers. The surface shall be compacted as soon as possible when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained.

To prevent adhesion of the mixture to the roller, the wheels shall be equipped with a scraper and kept properly moistened but excessive water will not be permitted.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power driven tampers. Tampers shall weigh not less than 275 pounds, have a tamping plate width not less than 15 inches, be rated at not less than 4,200 vibrations per minute, and be suitably equipped with a standard tamping plate wetting device.

Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.12 JOINTS. The formation of all joints shall be made in such a manner as to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be given a tack coat of bituminous material before placing any fresh mixture against the joint.

Longitudinal joints which are irregular, damaged, uncompacted, or otherwise defective or which have been left exposed for more than 4 hours, or whose surface temperature has cooled to less than 160° F shall be cut back 6 inches to expose a clean, sound surface for the full depth of the course. All contact surfaces shall be cleaned and dry prior and given a tack coat of bituminous material prior to placing any fresh mixture against the joint. The cost of this work and tack coat shall be considered incidental to the cost of the bituminous course.

401-4.13 SKID RESISTANT SURFACES/SAW-CUT GROOVING. If shown on the plans, skid resistant surfaces for asphalt pavements shall be provided by construction of saw-cut grooves. Saw-cut grooves must meet the requirements of Item P-621.

MATERIAL ACCEPTANCE

401-5.1 ACCEPTANCE SAMPLING AND TESTING.

Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Engineer at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor. Testing organizations performing these tests shall meet the requirements of ASTM D 3666. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction. All equipment in Contractor furnished laboratories shall be calibrated by an independent testing organization prior to the start of operations at the Contractor's expense. All equipment in Contractor furnished laboratories shall be calibrated by an independent testing organization prior to the start of operations at the Contractor's expense.

a. Plant-Produced Material. Plant-produced material shall be tested for stability, flow, and air voids on a lot basis. Sampling shall be from material deposited into trucks at the plant or from trucks at the job site. Samples shall be taken in accordance with ASTM D 979. A lot will consist of:

- one day or shift's production not to exceed 2,000 tons, or
- a half day or shift's production where a day's production is expected to consist of between 2,000 and 4,000 tons, or
- similar subdivisions for tonnages over 4,000 tons.

Where more than one plant is simultaneously producing material for the job, the lot sizes shall apply separately for each plant.

(1) Sampling. Each lot will consist of four equal sublots. Sufficient material for preparation of test specimens for all testing will be sampled by the Engineer on a random basis, in accordance with the procedures contained in ASTM D 3665. One set of laboratory compacted specimens will be prepared for each subplot in accordance with ASTM D 6926, at the number of blows required by paragraph 401-3.2, Table 1. Each set of laboratory compacted specimens will consist of three test portions prepared from the same sample increment.

The sample of bituminous mixture may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to stabilize to compaction temperature. The compaction temperature of the specimens shall be as specified in the job mix formula.

(2) Testing. Sample specimens shall be tested for stability and flow in accordance with ASTM D 6927. Air voids will be determined by the Engineer in accordance with ASTM D 3203.

Prior to testing, the bulk specific gravity of each test specimen shall be measured by the Engineer in accordance with ASTM D 2726 using the procedure for laboratory-prepared thoroughly dry specimens, or ASTM D 1188, whichever is applicable, for use in computing air voids and pavement density.

For air voids determination, the theoretical maximum specific gravity of the mixture shall be measured one time for each subplot in accordance with ASTM D 2041, Type C, D or E container. The value used in the air voids computation for each subplot shall be based on theoretical maximum specific gravity measurement for the subplot.

The stability and flow for each subplot shall be computed by averaging the results of all test specimens representing that subplot.

(3) Acceptance. Acceptance of plant produced material for stability, flow, and air voids shall be determined by the Engineer in accordance with the requirements of paragraph 401-5.2b.

b. Field Placed Material. Material placed in the field shall be tested for mat and joint density on a lot basis.

(1) Mat Density. The lot size shall be the same as that indicated in paragraph 401-5.1a and shall be divided into four equal sublots. One core of finished, compacted materials shall be taken by the Contractor from each subplot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D 3665. Cores shall not be taken closer than one foot from a transverse or longitudinal joint.

(2) Joint Density. The lot size shall be the total length of longitudinal joints constructed by a lot of material as defined in paragraph 401-5.1a. The lot shall be divided into four equal sublots. One core of finished, compacted materials shall be taken by the Contractor from each subplot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D 3665. ALL CORING SHALL BE CENTERED ON THE JOINT. THE MINIMUM CORE DIAMETER FOR JOINT DENSITY DETERMINATION SHALL BE 5 INCHES.

(3) Sampling. Samples shall be neatly cut with a core drill. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with diamond chips embedded in the metal cutting edge. The minimum diameter of the sample shall be five inches. Samples that are clearly defective, as a result of sampling, shall be discarded and another sample taken. The Contractor shall furnish all tools, labor, and materials for cutting samples, cleaning, and filling the cored pavement. Cored pavement shall be cleaned and core holes shall be filled in a manner acceptable to the Engineer and within one day after sampling.

(4) Testing. The bulk specific gravity of each cored sample will be measured by the Engineer in accordance with ASTM D 2726 or ASTM D 1188, whichever is applicable. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each subplot sample by the average bulk specific gravity of all laboratory prepared specimens for the lot, as determined in paragraph 401-5.1a(2). The bulk specific gravity used to determine the joint density at joints formed between different lots shall be the lowest of the bulk specific gravity values from the two different lots.

(5) Acceptance. Acceptance of field placed material for mat density will be determined by the Engineer in accordance with the requirements of paragraph 401-5.2b(1). Acceptance for joint density will be determined in accordance with the requirements of paragraph 401-5.2b(3).

c. Partial Lots — Plant-Produced Material. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot, or when the Contractor and Engineer agree in writing to allow overages or other minor tonnage placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

The last batch produced where production is halted will be sampled, and its properties shall be considered as representative of the particular subplot from which it was taken. In addition, an agreed to minor placement will be sampled, and its properties shall be considered as representative of the particular subplot from which it was taken. Where three sublots are produced, they shall constitute a lot. Where one or two sublots are produced, they shall be incorporated into the next lot, and the total number of sublots shall be used in the acceptance plan calculation, i.e., $n = 5$ or $n = 6$, for example. Partial lots at the end of asphalt production on the project shall be included with the previous lot.

d. Partial Lots - Field Placed Material. The lot size for field placed material shall correspond to that of the plant material, except that, in no cases, shall less than three (3) cored samples be obtained, i.e., $n = 3$.

401-5.2 ACCEPTANCE CRITERIA.

a. General. Acceptance will be based on the following characteristics of the bituminous mixture and completed pavement, as well as the implementation of the Contractor Quality Control Program and test results:

- (1)** Stability
- (2)** Flow
- (3)** Air voids
- (4)** Mat density
- (5)** Joint density
- (6)** Thickness
- (7)** Smoothness
- (8)** Grade

Mat density and air voids will be evaluated for acceptance in accordance with paragraph 401-5.2b(1). Stability and flow will be evaluated for acceptance in accordance with paragraph 401-5.2b(2). Joint density will be evaluated for acceptance in accordance with paragraph 401-5.2b(3).

Thickness will be evaluated by the Engineer for compliance in accordance with paragraph 401-5.2b(4). Acceptance for smoothness will be based on the criteria contained in paragraph 401-5.2b(5). Acceptance for grade will be based on the criteria contained in paragraph 401-5.2b(6).

The Engineer may at any time, notwithstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of bituminous mixture which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or improper mix temperature. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and if it can be demonstrated in the laboratory, in the presence of the Engineer, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

b. Acceptance Criteria.

(1) Mat Density and Air Voids. Acceptance of each lot of plant produced material for mat density and air voids shall be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. Acceptance and payment shall be determined in accordance with paragraph 401-8.1.

(2) Stability and Flow. Acceptance of each lot of plant produced material for stability and flow shall be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. If the PWL is less than 90 percent, the Contractor shall determine the reason and take corrective action. If the PWL is below 80 percent, the Contractor must stop production until the reason for poor stability and/or flow has been determined and adjustments to the mix are made.

(3) Joint Density. Acceptance of each lot of plant produced material for joint density shall be based on the percentage of material within specification limits (PWL). If the PWL of the lot is equal to or exceeds 90 percent, the lot shall be considered acceptable. If the PWL is less than 90 percent, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80 percent, the Contractor shall cease operations and until the reason for

poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint shall be reduced by five (5) points. This lot pay factor reduction shall be incorporated and evaluated in accordance with paragraph 401-8.1.

(4) Thickness. Thickness of each lift of surface course shall be evaluated by the Engineer for compliance to the requirements shown on the plans. Measurements of thickness shall be made by the Engineer using the cores extracted for each subplot for density measurement. The maximum allowable deficiency at any point shall not be more than $\frac{1}{4}$ inch less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, shall not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or subplot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the Engineer to circumscribe the deficient area.

(5) Smoothness. The final surface shall be free from roller marks. The finished surfaces of each course of the pavement, except the finished surface of the final course, shall not vary more than $\frac{3}{8}$ inch when evaluated with a 12-foot straightedge. The finished surface of the final course of pavement shall not vary more than $\frac{1}{4}$ inch when evaluated with a 12-foot straightedge. The lot size shall be 2000 square yards. Smoothness measurements shall be made at 50 foot intervals and as determined by the Engineer. In the longitudinal direction, a smoothness reading shall be made at the center of each paving lane. In the transverse direction, smoothness readings shall be made continuously across the full width of the pavement. However, transverse smoothness readings shall not be made across designed grade changes. At warped transition areas, straightedge position shall be adjusted to measure surface smoothness and not design grade transitions. When more than 15 percent of all measurements within a lot exceed the specified tolerance, the Contractor shall remove the deficient area to the depth of the final course of pavement and replace with new material. Skin patching shall not be permitted. Isolated high points may be ground off providing the course thickness complies with the thickness specified on the plans. High point grinding will be limited to 15 square yards. Areas in excess of 15 square yards will require removal and replacement of the pavement in accordance with the limitations noted above.

(6) Grade. The finished surface of the pavement shall not vary from the gradeline elevations and cross sections shown on the plans by more than $\frac{1}{2}$ inch. The finished grade of each lot will be determined by running levels at intervals of 50 feet or less longitudinally and all breaks in grade transversely (not to exceed 50 feet) to determine the elevation of the completed pavement. The Contractor shall pay the cost of surveying of the level runs that shall be performed by a licensed surveyor. The documentation, stamped and signed by a licensed surveyor, shall be provided by the Contractor to the Engineer. The lot size shall be 2000 square yards. When more than 15 percent of all the measurements within a lot are outside the specified tolerance, or if any one shot within the lot deviates $\frac{3}{4}$ inch or more from planned grade, the Contractor shall remove the deficient area to the depth of the final course of pavement and replace with new material. Skin patching shall not be permitted. Isolated high points may be ground off providing the course thickness complies with the thickness specified on the plans. The surface of the ground pavement shall have a texture consisting of grooves between 0.090 and 0.130 inches wide. The peaks and ridges shall be approximately $\frac{1}{32}$ inch higher than the bottom of the grooves. The pavement shall be left in a clean condition. The removal of all of the slurry resulting from the grinding operation shall be continuous. The grinding operation should be controlled so the residue from the operation does not flow across other lanes of pavement. High point grinding will be limited to 15 square yards. Areas in

excess of 15 square yards will require removal and replacement of the pavement in accordance with the limitations noted above.

c. Percentage of Material Within Specification Limits (PWL). The percentage of material within specification limits (PWL) shall be determined in accordance with procedures specified in Section 110 of the General Provisions. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

d. Outliers. All individual tests for mat density and air voids shall be checked for outliers (test criterion) in accordance with ASTM E 178, at a significance level of 5 percent. Outliers shall be discarded, and the PWL shall be determined using the remaining test values.

**TABLE 5.
MARSHALL ACCEPTANCE LIMITS FOR STABILITY, FLOW, AIR VOIDS, DENSITY**

TEST PROPERTY	Pavements Designed for Aircraft Gross Weights of 60,000 Lbs. or More or Tire Pressures of 100 Psi or More	
	75	
	Specification Tolerance Limits	
	L	U
Stability, minimum, pounds	1800	--
Flow, 0.01-inch	8	16
Air Voids Total Mix, percent	2	5
Surface Course Mat Density, percent	96.3	--
Base Course Mat Density, percent	95.5	--
Joint density, percent	93.3	--

The criteria in Table 5 is based on production processes which have a variability with the following standard deviations:

Surface Course Mat Density (%), 1.30

Base Course Mat Density (%), 1.55

Joint Density (%), 2.1

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 98 percent with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 97.5 percent with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 96 percent with 2.1% or less variability.

401-5.3 RESAMPLING PAVEMENT FOR MAT DENSITY.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the Engineer. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-5.1b and 401-5.2b(1). Only one resampling per lot will be permitted.

(1) A redefined PWL shall be calculated for the resampled lot. The number of tests used to calculate the redefined PWL shall include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for Resampled Lots. The redefined PWL for a resampled lot shall be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E 178, at a significance level of 5 percent.

CONTRACTOR QUALITY CONTROL

401-6.1 GENERAL.

The Contractor shall develop a Quality Control Program in accordance with Section 100 of the General Provisions. The program shall address all elements that affect the quality of the pavement including, but not limited to:

- a. Mix Design
- b. Aggregate Grading
- c. Quality of Materials
- d. Stockpile Management
- e. Proportioning
- f. Mixing and Transportation
- g. Placing and Finishing
- h. Joints
- i. Compaction
- j. Surface Smoothness
- k. Personnel
- l. Laydown Plan

The Contractor shall perform quality control sampling, testing, and inspection during all phases of the work and shall perform them at a rate sufficient to ensure that the work conforms to the contract requirements, and at minimum test frequencies required by paragraph 401-6.3 and Section 100 of the General Provisions. As a part of the process for approving the Contractor's plan, the Engineer may require the Contractor's technician to perform testing of samples to demonstrate an acceptable level of performance.

No partial payment will be made for materials that are subject to specific quality control requirements without an approved plan.

401-6.2 TESTING LABORATORY.

The Contractor shall provide a fully equipped asphalt laboratory meeting the requirements of paragraph 401-3.5 and 401-4.2a(2) located at the plant or job site. The Contractor shall provide the Engineer with certification stating that all of the testing equipment to be used is properly calibrated and will meet the specifications applicable for the specified test procedures.

401-6.3 QUALITY CONTROL TESTING.

The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved Quality Control Program. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

a. Asphalt Content. A minimum of two tests shall be performed per lot in accordance with ASTM D 6307 or ASTM D 2172 for determination of asphalt content. The weight of ash portion of the test, as described in ASTM D 2172, shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture. The asphalt content for the lot will be determined by averaging the test results.

The use of the nuclear method for determining asphalt content in accordance with ASTM D 4125 is permitted, provided that it is calibrated for the specific mix being used.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ASTM D 5444 and ASTM C 136 (Dry Sieve). When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix or continuous mix plants, and tested in accordance with ASTM C 136 (dry sieve) using actual batch weights to determine the combined aggregate gradation of the mixture.

c. Moisture Content of Aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C 566.

d. Moisture Content of Mixture. The moisture content of the mixture shall be determined once per lot in accordance with ASTM D 1461 or AASHTO T110.

e. Temperatures. Temperatures shall be checked, at least four times per lot, at necessary locations to determine the temperatures of the dryer, the bitumen in the storage tank, the mixture at the plant, and the mixture at the job site.

f. In-Place Density Monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D 2950.

g. Additional Testing. Any additional testing that the Contractor deems necessary to control the process may be performed at the Contractor's option.

h. Monitoring. The Engineer reserves the right to monitor any or all of the above testing.

401-6.4 SAMPLING.

When directed by the Engineer, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-6.5 CONTROL CHARTS.

The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation and asphalt content.

Control charts shall be posted in a location satisfactory to the Engineer and shall be kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the Engineer may suspend production or acceptance of the material.

a. Individual Measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation and asphalt content. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

CONTROL CHART LIMITS FOR INDIVIDUAL MEASUREMENTS		
Sieve	Action Limit	Suspension Limit
¾ inch	0%	0%
½ inch	+/-6%	+/-9%
⅜ inch	+/-6%	+/-9%
No. 4	+/-6%	+/-9%
No. 16	+/-5%	+/-7.5%
No. 50	+/-3%	+/-4.5%
No. 200	+/-2%	+/-3%
Asphalt Content	+/-0.45%	+/-0.70%

b. Range. Control charts for range shall be established to control process variability for the test parameters and Suspension Limits listed below. The range shall be computed for each lot as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of $n = 2$. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for $n = 3$ and by 1.27 for $n = 4$.

CONTROL CHART LIMITS BASED ON RANGE (Based on $n = 2$)	
Sieve	Suspension Limit
½ inch	11 percent
⅜ inch	11 percent
No. 4	11 percent
No. 16	9 percent
No. 50	6 percent
No. 200	3.5 percent
Asphalt Content	0.8 percent

c. Corrective Action. The Contractor Quality Control Program shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain sets of rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

- (1) One point falls outside the Suspension Limit line for individual measurements or range; or
- (2) Two points in a row fall outside the Action Limit line for individual measurements.

401-6.6 QUALITY CONTROL REPORTS.

The Contractor shall maintain records and shall submit reports of quality control activities daily, in accordance with the Contractor Quality Control Program described in General Provisions, Section 100.

METHOD OF MEASUREMENT

401-7.1 MEASUREMENT.

Plant mix bituminous concrete pavement shall be measured by the number of tons of bituminous mixture used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 PAYMENT.

Payment for a lot of bituminous concrete pavement meeting all acceptance criteria as specified in Paragraph 401-5.2 shall be made based on results of tests for smoothness, mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1a for mat density and air voids and 401-8.1c for smoothness, subject to the limitation that:

The total project payment for plant mix bituminous concrete pavement shall not exceed 100 percent of the product of the contract unit price and the total number of tons of bituminous mixture used in the accepted work (See Note 2 under Table 6).

The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

a. Basis of Adjusted Payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100 percent or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100 percent or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100 percent.

TABLE 6. PRICE ADJUSTMENT SCHEDULE ¹

Percentage of Material Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4PWL – 12
Below 55	Reject ²

¹ ALTHOUGH IT IS THEORETICALLY POSSIBLE TO ACHIEVE A PAY FACTOR OF 106 PERCENT FOR EACH LOT, ACTUAL PAYMENT ABOVE 100 PERCENT SHALL BE SUBJECT TO THE TOTAL PROJECT PAYMENT LIMITATION SPECIFIED IN PARAGRAPH 401-8.1.

² The lot shall be removed and replaced. However, the Engineer may decide to allow the rejected lot to remain. In that case, if the Engineer and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50 percent of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected 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 401-8.1. Payment in excess of 100 percent for accepted lots of bituminous concrete pavement shall be used to offset payment for accepted lots of bituminous concrete pavement that achieve a lot pay factor less than 100 percent.

b. Payment. Payment will be made under:

Item P-401a	Bituminous Base Course (4 Inches Thick) - per ton
Item P-401b	Bituminous Material (PG 70-22) (Base) - per ton
Item P-401c	Bituminous Surface Course (4 Inches Thick) – per ton
Item P-401d	Bituminous Material (PG 70-22)

TESTING REQUIREMENTS

ASTM C 29	Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C 88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 117	Materials Finer than 75µm (No.200) Sieve in Mineral Aggregates by Washing
ASTM C 127	Specific Gravity and Absorption of Coarse Aggregate
ASTM C 131	Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 183	Sampling and the Amount of Testing of Hydraulic Cement

ASTM C 566	Total Evaporable Moisture Content of Aggregate by Drying
ASTM D 75	Sampling Aggregates
ASTM D 979	Sampling Bituminous Paving Mixtures
ASTM D 995	Mixing Plants for Hot-Mixed Hot-Laid Bituminous Paving Mixtures
ASTM D 1073	Fine Aggregate for Bituminous Paving Mixtures
ASTM D 1188	Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
ASTM D 1461	Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D 2041	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2419	Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 2489	Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D 2726	Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D 2950	Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D 3203	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D 3665	Random Sampling of Construction Materials
ASTM D 3666	Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D 4125	Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4791	Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 4867	Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D 5444	Mechanical Size Analysis of Extracted Aggregate
ASTM D 6926	Preparation of Bituminous Specimens Using MARSHALL Apparatus

ASTM D 6927	MARSHALL Stability and Flow of Bituminous Mixtures
ASTM E 11	Wire-Cloth Sieves for Testing Purposes
ASTM E 178	Dealing with Outlying Observations
ASTM E 1274	Measuring Pavement Roughness Using a Profilograph
AASHTO T 30	Mechanical Analysis of Extracted Aggregate
AASHTO T 110	Moisture or Volatile Distillates in Bituminous Paving Mixtures

The Asphalt Institute's Mix Design Methods for Asphalt Concrete
Manual No. 2 (MS-2)

MATERIAL REQUIREMENTS

ASTM D 242	Mineral Filler for Bituminous Paving Mixtures
ASTM D 946	Penetration Graded Asphalt Cement for Use in Pavement Construction
ASTM D 3381	Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 4552	Classifying Hot-Mix Recycling Agents
AASHTO M320	Performance Graded Asphalt Binder

END OF ITEM P-401

**ITEM P-602
BITUMINOUS PRIME COAT**

DESCRIPTION

602-1.1

This item shall consist of an application of bituminous material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 BITUMINOUS MATERIAL.

The types, grades, controlling specifications, and application temperatures for the bituminous materials are given in Table 1. The Engineer shall designate the specific material to be used.

TABLE 1. BITUMINOUS MATERIAL

Type and Grade	Specification	Application Temperatures \1\	
		Deg. F	Deg. C
Emulsified Asphalt			
SS-1, SS-1h	ASTM D 977	70-160	20-70
MS-2, HFMS-1	ASTM D 977	70-160	20-70
CSS-1, CSS-1h	ASTM D 2397	70-160	20-70
CMS-2	ASTM D 2397	70-160	20-70
Cutback Asphalt			
RC-30	ASTM D 2028	80+	30+
RC-70	ASTM D 2028	120+	50+
RC-250	ASTM D 2028	165+	75+

\1\ The maximum temperature for cutback asphalt shall be that at which fogging occurs.

CONSTRUCTION METHODS

602-3.1 WEATHER LIMITATIONS.

The prime coat shall be applied only when the existing surface is dry or contains sufficient moisture to get uniform distribution of the bituminous material, when the atmospheric temperature is above 60°F, and when the weather is not foggy or rainy. The temperature requirements may be waived, but only when so directed by the Engineer.

602-3.2 EQUIPMENT.

The equipment used by the Contractor shall include a self-powered pressure bituminous material distributor and equipment for heating bituminous material.

The distributor shall be designed, equipped, maintained, and operated so that bituminous material at even heat may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 10 percent. Distributor equipment shall include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

If the distributor is not equipped with an operable quick shut off valve, the prime operations shall be started and stopped on building power. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the owner.

A power broom and/or blower shall be provided for any required cleaning of the surface to be treated.

602-3.3 APPLICATION OF BITUMINOUS MATERIAL.

Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The bituminous material including solvent shall be uniformly applied with a bituminous distributor at the rate of 0.25 to 0.50 gallons per square yard depending on the base course surface texture. The type of bituminous material and application rate shall be approved by the Engineer prior to application.

Following the application, the primed surface shall be allowed to dry not less than 48 hours without being disturbed or for such additional time as may be necessary to permit the drying out of the prime coat until it will not be picked up by traffic or equipment. This period shall be determined by the Engineer. The surface shall then be maintained by the Contractor until the surfacing has been placed. Suitable precautions shall be taken by the Contractor to protect the primed surface against damage during this interval, including supplying and spreading any sand necessary to blot up excess bituminous material.

602-3.4 BITUMINOUS MATERIAL CONTRACTOR'S RESPONSIBILITY.

Samples of the bituminous materials that the Contractor proposes to use, together with a statement as to their source and character, must be submitted and approved before use of such material begins. The Contractor shall require the manufacturer or producer of the bituminous materials to furnish material subject to this and all other pertinent requirements of the contract. Only satisfactory materials, so demonstrated by service tests, shall be acceptable.

The Contractor shall furnish vendor's certified test reports for each carload, or equivalent, of bituminous material shipped to the project. The test reports shall contain all the data required by the applicable specification. If the Contractor applies the prime material prior to receipt of the tests reports, payment for the material shall be withheld until they are received. If the material does not pass the specifications it shall be replaced at the contractor's expense. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as basis for final acceptance. All such test reports shall be subject to verification by testing samples of materials received for use on the project.

602-3.5 FREIGHT AND WEIGH BILLS.

Before the final estimate is allowed, the Contractor shall file with the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the bituminous materials actually used in the construction covered by the contract. The Contractor shall not remove bituminous material from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer.

Copies of freight bills and weigh bills shall be furnished to the Engineer during the progress of the work.

METHOD OF MEASUREMENT

602-4.1

The bituminous material for prime coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F in accordance with ASTM D 1250.

BASIS OF PAYMENT

602-5.1

Payment shall be made at the contract unit price per ton for bituminous prime coat. This price shall be full compensation for furnishing all materials and for all preparation, delivering, and applying the materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-602 Bituminous Prime Coat - per ton

MATERIAL REQUIREMENTS

ASTM D 2028 Cutback Asphalt (Rapid Curing Type)

TESTING REQUIREMENTS

ASTM D 1250 Petroleum Measurement Tables

Asphalt Institute Manual MS-6 Asphalt Pocketbook of Useful Information (Temperature-Volume Corrections for Emulsified Asphalts)
Table IV-3

END OF ITEM P-602

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**ITEM P-603
BITUMINOUS TACK COAT**

DESCRIPTION

603-1.1

This item shall consist of preparing and treating a bituminous or concrete surface with bituminous material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 BITUMINOUS MATERIALS.

The bituminous material shall be either cutback asphalt, emulsified asphalt, or tar and shall conform to the requirements of Table 1. The type, grade, controlling specification, and application temperature of bituminous material to be used shall be specified by the Engineer.

TABLE 1. BITUMINOUS MATERIAL

Type and Grade	Specification	Application Temperature	
		Deg. F	Deg. C
Emulsified Asphalt			
SS-1, SS-1h	ASTM D 977	75-130	25-55
CSS-1, CSS-1h	ASTM D 2397	75-130	25-55
Cutback Asphalt			
RC-70	ASTM D 2028	120-160	50-70
Tar			
RTCB 5, RTCB 6	AASHTO M 52	60-120	15-50

CONSTRUCTION METHODS

603-3.1 WEATHER LIMITATIONS.

The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is above 60°F. The temperature requirements may be waived, but only when so directed by the Engineer.

603-3.2 EQUIPMENT.

The Contractor shall provide equipment for heating and applying the bituminous material.

The distributor shall be designed, equipped, maintained, and operated so that bituminous material at even heat may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 10 percent. Distributor equipment shall include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

If the distributor is not equipped with an operable quick shut off valve, the tack operations shall be started and stopped on building paper. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the owner.

A power broom and/or blower shall be provided for any required cleaning of the surface to be treated.

603-3.3 APPLICATION OF BITUMINOUS MATERIAL.

Immediately before applying the tack coat, the full width of surface to be treated shall be swept with a power broom and/or airblast to remove all loose dirt and other objectionable material.

Emulsified asphalt shall be diluted by the addition of water when directed by the Engineer and shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before any of the overlying mixture is placed on the tacked surface.

The bituminous material including vehicle or solvent shall be uniformly applied with a bituminous distributor at the rate of 0.05 to 0.15 gallons per square yard depending on the condition of the existing surface. The type of bituminous material and application rate shall be approved by the Engineer prior to application.

Following the application, the surface shall be allowed to cure without being disturbed for such period of time as may be necessary to permit drying out and setting of the tack coat. This period shall be determined by the Engineer. The surface shall then be maintained by the Contractor until the next course has been placed. Suitable precautions shall be taken by the Contractor to protect the surface against damage during this interval.

603-3.4 BITUMINOUS MATERIAL CONTRACTOR'S RESPONSIBILITY.

Samples of the bituminous material that the Contractor proposes to use, together with a statement as to its source and character, must be submitted and approved before use of such material begins. The Contractor shall require the manufacturer or producer of the bituminous material to furnish material subject to this and all other pertinent requirements of the contract. Only satisfactory materials so demonstrated by service tests, shall be acceptable.

The Contractor shall furnish the vendor's certified test reports for each carload, or equivalent, of bituminous material shipped to the project. The tests reports shall contain all the data required by the applicable specification. If the Contractor applies the material prior to receipt of the tests reports, payment for the material shall be withheld until they are received. If the material does not pass the specifications it shall be replaced at the contractor's expense. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verification by testing samples of material received for use on the project.

603-3.5 FREIGHT AND WEIGH BILLS.

Before the final estimate is allowed, the Contractor shall file with the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the bituminous materials actually used in the construction covered by the contract. The Contractor shall not remove bituminous material from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer. Copies of freight bills and weigh bills shall be furnished to the Engineer during the progress of the work.

METHOD OF MEASUREMENT

603-4.1

The bituminous material for tack coat shall not be measured.

BASIS OF PAYMENT

603.5-1

No payment shall be made for bituminous tack coat material. The price for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item shall be incidental to P-401.

MATERIAL REQUIREMENTS

ASTM D 633	Volume Correction Table for Road Tar
ASTM D 977	Emulsified Asphalt
ASTM D1250	Petroleum Measurement Tables
ASTM D 2028	Cutback Asphalt (Rapid-Curing Type)
ASTM D 2397	Cationic Emulsified Asphalt
Asphalt Institute Manual MS-6 Table IV-3	Asphalt Pocketbook of Useful Information (Temperature-Volume Corrections for Emulsified Asphalts)

END ITEM P-603

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ITEM P-608
EMULSIFIED ASPHALT SEAL COAT

DESCRIPTION ¹

608-1.1 This item shall consist of the application of a emulsified asphalt surface treatment composed of an emulsion of natural and refined asphalt materials, water and, if specified, a polymer additive, for taxiways and runways with the application of a suitable aggregate to maintain adequate surface friction; and airfield secondary and tertiary pavements including low-speed taxiways, shoulders, overruns, roads, parking areas, and other general applications with or without aggregate applied. Emulsified Asphalt Seal Coat products assist in pavement preservation through reducing the rate of pavement oxidation. The emulsified asphalt surface treatment shall be applied in accordance with these specifications, and as shown on the plans or as directed by the Engineer.

¹ The terms seal coat and sealer binder and asphalt material are interchangeable throughout this specification. The term emulsified asphalt means an emulsion of natural and refined asphalt materials.

608-1.2 Quantities of materials per square yard (square meter). The approximate amounts of materials per square yard (square meter) for the asphalt surface treatment shall be as provided in the table for the treatment area(s) at the specified dilution rate(s) as noted on the plans. The actual application rates will vary within the range specified to suit field conditions and will be recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation.

Application Rate

Dilution Rate	Quantity of Emulsion gal/yd²	Quantity of Aggregate lb/yd²
2:1	0.08-0.15	0.20-0.50

MATERIALS

608-2.1 Aggregate. The aggregate material shall be a dry, clean, dust and dirt free, sound, durable, angular shaped manufactured specialty sand, such as that used as an abrasive, with a Mohs hardness of 6 to 8. The Contractor shall submit manufacturer's technical data and a manufacturer's certification indicating that the specialty sand meets the requirements of the specification to the Engineer prior to start of construction. The sand must be approved for use by the Engineer and shall meet the following gradation limits when tested in accordance with ASTM C136 and ASTM C117:

Aggregate Material Gradation Requirements

Sieve Designation (square openings)	Percentage by Weight Retained Sieves
No. 8 (2.38 mm)	0
No. 16 (1.19 mm)	0-8
No. 20 (0.84 mm)	0-28
No. 30 (0.60 mm)	20-50
No. 40 (0.42 mm)	10-55
No. 50 (0.30 mm)	0-30
No. 70 (0.21 mm)	0-5
No. 100 (0.15 mm)	0-2
No. 200 (0.07 mm)	0-2

The Contractor shall provide a certification showing particle size analysis and properties of the material delivered for use on the project. The Contractor's certification may be subject to verification by testing the material delivered for use on the project.

608-2.2 Asphalt material. The Contractor shall furnish the vendor's certified test reports for the emulsified asphalt, in its concentrated form, to the Engineer, showing that the material meets the following properties:

Concentrated Asphalt Material Properties

Properties	Specification	Limits
Saybolt Furol Viscosity at 77°F (25°C)	ASTM D244	20 – 100 seconds
Residue by Distillation or Evaporation	ASTM D244	57% minimum
Sieve Test	ASTM D244	0.1% maximum
24-hour Stability	ASTM D244	1% maximum
5-day Settlement Test	ASTM D244	5.0% maximum
Particle Charge ¹	ASTM D244	Positive 6.5 maximum pH

¹ pH may be used in lieu of the particle charge test which is sometimes inconclusive in slow setting, asphalt emulsions.

The asphalt material concentrate must be diluted with heated water prior to application. The asphalt material, when diluted in the volumetric proportion of two parts concentrated asphalt material to one part hot water shall have the following properties:

One-to-One Dilution Emulsion Properties

Properties	Specification	Limits
In Ready-to-Apply Form, one part concentrate to one part water, by volume		
Saybolt Furol Viscosity at 77°F (25°C)	ASTM D244	10 – 50 seconds
Residue by Distillation or Evaporation	ASTM D244	28.5% minimum
Pumping Stability ¹		Pass

¹ Pumping stability is tested by pumping one pint (475 ml) of seal coat diluted one (1) part concentrate to one (1) part water, at 77°F (25°C), through a 1/4-inch (6 mm) gear pump operating 1750 rpm for 10 minutes with no significant separation or coagulation.

Two-to-One Dilution Emulsion Properties

Properties	Specification	Limits
In Ready-to-Apply Form, two parts concentrate to one part water, by volume		
Saybolt Furol Viscosity at 77°F (25°C)	ASTM D244	10 – 50 seconds
Residue by Distillation or Evaporation	ASTM D244	38% minimum
Pumping Stability ¹		Pass

¹ Pumping stability is tested by pumping one pint (475 ml) of seal coat diluted one (1) part concentrate to one (1) part water, at 77°F (25°C), through a 1/4-inch (6 mm) gear pump operating 1750 rpm for 10 minutes with no significant separation or coagulation.

The asphalt material base residue shall contain not less than 20% gilsonite, or uinitaite and shall not contain any tall oil pitch or coal tar material. The material shall be compatible with asphaltic concrete, and have a 5-year minimum proven performance record at airports with similar climatic conditions. Curing time, under recommended application conditions, shall not exceed eight (8) hours.

Emulsion Residue by Distillation or Evaporation Tests

Properties	Specification	Limits
Viscosity at 275°F (135°C)	ASTM D4402	1750 cts maximum
Solubility in 1, 1, 1 trichloroethylene	ASTM D2042	97.5% minimum
Penetration	ASTM D5	50 dmm maximum
Asphaltenes	ASTM D2007	15% minimum
Saturates	ASTM D2007	15% maximum
Polar Compounds	ASTM D2007	25% minimum
Aromatics	ASTM D2007	15% minimum

The Contractor shall furnish vendor's certified test reports showing that the material is the type, grade and quality specified for each load of asphalt material delivered to the project. The certification shall also show the shipment number, refinery, consignee, destination, contract number and date of shipment. The test reports and certification shall be delivered to the Engineer before permission is granted to use the material. The furnishing of the vendor's certified test report for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's material test report certification may be subject to verification by testing the material delivered for use on the project.

The asphalt material storage and handling temperature shall be between 50°F - 160°F (10°C - 70°C) and the material shall be protected from freezing, or whenever outside temperature drops below 40°F (4°C) for prolonged time periods.

608-2.3 Water. Water used in making the emulsion shall be potable, free from harmful soluble salts and chemicals, and at least 100°F (38°C).

608-2.4 Polymer. The polymer shall be a vinyl acrylic polymer approved for use by the asphalt material manufacturer. The Contractor shall submit manufacturer's technical data, the manufacturer's certification indicating that the polymer meets the requirements of the specification, and the asphalt material manufacturer's approval of its use to the Engineer. The polymer must be approved for use by the Engineer and shall meet the following properties:

Polymer Properties

Properties	Limits
Solids Content	54 to 57%, Percent by Weight
Weight	8.9 to 9.8 pounds/gallon (1.07 to 1.17 kg/L)
pH	4.0 to 6.0
Particle Charge	Nonionic/Anionic
Mechanical Stability	Excellent
Film Forming Temperature, °C	+5°C, minimum
Tg, °C	22°C, maximum

APPLICATION RATE

608-3.1 Material performance for runway and high-speed taxiway projects. (Deleted)

608-3.2 Test areas and test sections. A qualified manufacturer's representative shall be present in the field to assist the Contractor in applying test areas and/or test sections to determine the appropriate application rate of both emulsion and sand to be approved by the Engineer.

A test area and/or section shall be applied for each differing HMA pavement surface identified in the project. The test area(s) and/or test section(s) shall be used to determine the material application rate(s) of both emulsion and sand prior to full production. The same equipment and method of operation shall be utilized on the test area(s) and/or test section(s) as will be utilized on the remainder of the work.

a. For taxiway, taxilane and apron surfaces. Prior to full application, the Contractor shall place test areas at varying application rates as advised by the manufacturer's representative and acceptable to the Engineer to determine appropriate application rate(s). The test areas will be located on representative section(s) of the pavement to receive the asphalt surface treatment designated by the Engineer.

b. For runway and high speed exit taxiway surfaces. Prior to full application, the Contractor shall place a series of test sections a minimum of 300 feet (90 m) long by 12 feet (3.6 m) wide, or width of anticipated application, whichever is greater, at varying application rates as recommended by the manufacturer's representative and acceptable to the Engineer to determine appropriate application rate(s). The area to be tested will be located on a representative section of the pavement to receive the asphalt surface treatment designated by the Engineer. Before beginning the test section(s), the skid resistance of the existing pavement shall be determined for each test section with a continuous friction measuring equipment (CFME). The skid resistance test after application shall be at approximately the same location as the test done on the existing pavement. The Contractor may begin testing the skid resistance of runway and high speed exit taxiway test sections after application of the asphalt surface treatment has fully cured. Aircraft shall not be permitted on the runway or high speed exit taxiway test sections for a minimum of 24 hours and until such time as the Contractor validates that its surface friction meets AC 150/5320-12. The results of the friction evaluation meet or exceed the Maintenance Planning levels provided in Table 3-2, "Friction Level Classification for Runway Pavement Surfaces," in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid-resistant Airport Pavement Surfaces, when tested at speeds of 40 and 60 mph (65 and 95 km/h) wet with approved CFME.

If the test section should prove to be unsatisfactory, necessary adjustments to the application rate, placement operations, and equipment shall be made. Additional test sections shall be placed and additional skid resistance tests performed and evaluated. Full production shall not begin without the Engineer's approval of an appropriate application rate(s). Acceptable test sections shall be paid for in accordance with paragraph 608-8.1.

CONSTRUCTION METHODS

608-4.1 Worker safety. The seal coat product shall be handled with caution. The Contractor shall obtain a Material Safety Data Sheet (MSDS) for both the asphalt emulsion product and sand and require workmen to follow the manufacturer's recommended safety precautions.

608-4.2 Weather limitations. The asphalt emulsion shall be applied only when the existing pavement surface is dry and when the weather is not foggy, rainy, or when the wind velocity will prevent the uniform application of the material. No material shall be applied when dust or sand is blowing or when rain is anticipated within eight (8) hours of application completion. The atmospheric temperature and the pavement surface temperature shall both be above 60°F (16°C) and rising. During application, account for wind drift. Cover existing buildings, structures, runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers as necessary to protect against overspray before applying the

emulsion. Should emulsion get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the Engineer, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

608-4.3 Equipment and tools. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of the work.

a. Pressure distributor. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spreader bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven (700) feet per minute. Test the equipment under pressure for leaks and to ensure it is in good working order before use.

The distributor truck shall be equipped with a 12-foot, minimum, spreader bar with individual nozzle control. The distributor truck shall be capable of specific application rates in the range of 0.05 to 0.25 gallons per square yard. These rates shall be computer-controlled rather than mechanical. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy.

A distributor truck shall be provided, if necessary, equipped to effectively heat and mix the material to the required temperature prior to application. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Care shall be taken not to overheat or over mix the material.

The distributor shall be equipped to hand spray the emulsion in areas identified either on the plans or by the Engineer.

b. Aggregate spreader. The asphalt distributor truck will be equipped with an aggregate spreader mounted to the distributor truck that can apply sand to the emulsion in a single pass operation without driving through wet emulsion. The aggregate spreader shall be equipped with a variable control system capable of uniformly distributing the sand at the specified rate at varying application widths and speeds. The sander shall have a minimum hopper capacity of at least 3,000 pounds of sand. Push-type hand sanders will be allowed for use around lights, signs and other obstructions.

c. Power broom/blower. A power broom and/or blower shall be provided for removing loose material from the surface to be treated.

d. Equipment calibration. The Contractor shall calibrate the equipment using either of the following procedures:

(1) First procedure. The Contractor shall furnish a State Calibration Certification for the emulsified asphalt distributor, from any state providing that service, or other acceptable agency certification approved by the Engineer, and the calibration date shall have been within six (6) months of the contract award, or up to 12 months if supporting documents substantiate continuous work using the same distributor.

(2) Second procedure. The Contractor shall furnish all equipment, materials and labor necessary to calibrate the emulsified asphalt distributor and the aggregate spreader. Perform all calibrations with the approved job materials and prior to applying the specified coatings to the prepared surface. Perform calibration of the emulsified asphalt distributor in accordance with ASTM D2995. Perform work to calibrate the tank and measuring devices of the distributor. Perform inspection and calibration at the beginning of the work and at least once a day during construction.

608-4.4 Preparation of asphalt pavement surfaces. Clean pavement surface immediately prior to placing the seal coat by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with the oil spot primer. Any additional surface preparation, such as crack repair, shall be in accordance with paragraph 101-3.6.

a. New asphalt pavement surfaces. Allow new asphalt pavement surfaces to cure so that there is no concentration of oils on the surface. A period of at least 30 days at 70°F (21°C) daytime temperatures shall elapse between the placement of a hot mixed asphalt concrete surface course and the application of the surface treatment.

Perform a water-break-free test to confirm that the surface oils have degraded and dissipated. (Cast approximately one gallon of clean water out over the surface. The water should sheet out and wet the surface uniformly without crawling or showing oil rings.) If signs of crawling or oil rings are apparent on the pavement surface, additional time must be allowed for additional curing and retesting of the pavement surface prior to treatment.

608-4.5 Emulsion mixing. The application emulsion shall be obtained by blending asphalt material concentrate, water and polymer, if specified. Always add heated water to the asphalt material concentrate, never add asphalt material concentrate to heated water. Mix one part heated water to two parts asphalt material concentrate, by volume.

If polymer is required, add 1% polymer, by volume, to the emulsion mix. If the polymer is added to the emulsion mix at the plant, submit weigh scale tickets to the Engineer. As an option, the polymer may be added to the emulsion mix at the job site provided the polymer is added slowly while the circulating pump is running. The mix must be agitated for a minimum of 15 minutes or until the polymer is mixed to the satisfaction of the Engineer.

608-4.6 Application of asphalt emulsion. The asphalt emulsion shall be applied using a pressure distributor upon the properly prepared, clean and dry surface at the application rate recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation for each designated treatment area. The asphalt emulsion should be applied at a temperature between 130°F (54°C) and 160°F (70°C) or in accordance with the manufacturer's recommendation.

Pavement surfaces which have excessive runoff of seal coat due to excessive amount of material being applied or excessive surface grade shall be treated in two or more applications to the specified application rate at no additional cost to the Owner. Each additional application shall be performed after the prior application of material has penetrated into the pavement.

If low spots and depressions greater than 1/2 inch in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be broomed with a broom drag. Brooming shall continue until the pavement surface is free of any pools of excess material. Ponding and/or puddling shall not cause excessive pavement softening and/or additional distress. The Engineer shall inspect and approve areas after brooming.

During all applications, the surfaces of adjacent structures shall be protected to prevent their being spattered or marred. Asphalt materials shall not be discharged into borrow pits or gutters or on the airport area.

608-4.7 Application of aggregate material. Immediately following the application of the asphalt emulsion or as directed by the Engineer, sand at the rate recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation for each designated application area, shall be spread uniformly over the asphalt emulsion. The aggregate shall be spread to the same width of application as the asphalt material and shall not be applied in such thickness as to cause blanketing.

Sprinkling of additional aggregate material, and spraying additional asphalt material over areas that show up having insufficient cover or bitumen, shall be done by hand whenever necessary. In areas where hand work is necessitated, the sand shall be applied before the sealant begins to break.

Sanding shall be performed to prevent excessive amounts of sand from accumulating on the pavement prior to the emulsion being applied. The Contractor shall clean areas with excess or loose sand and dispose of off airport property.

QUALITY CONTROL

608-5.1 Manufacturer's representation. The manufacturer's representative shall have knowledge of the material, procedures, and equipment described in the specification and shall be responsible for determining the application rates and shall oversee the preparation and application of the seal coat product. Documentation of the manufacturer representative's experience and knowledge for applying the seal coat product shall be furnished to the Engineer a minimum of 10 work days prior to placement of the test sections. The cost of the manufacturer's representative shall be included in the bid price.

608-5.2 Contractor qualifications. The Contractor shall provide the Engineer Contractor qualifications for applicators, personnel and equipment. The Contractor shall also provide documentation that the Contractor is qualified to apply the seal coat and to have made at least three (3) applications similar to this project in the past two (2) years.

MATERIAL ACCEPTANCE

608-6.1 Friction tests. (Deleted)

METHOD OF MEASUREMENT

608-7.1 Asphalt surface treatment. The quantity of asphalt surface treatment shall be measured by the square yards of material applied in accordance with the plans and specifications and accepted by the Engineer.

The Contractor must furnish the Engineer with the certified weigh bills when materials are received for the asphalt material used under this contract. The Contractor must not remove material from the tank car or storage tank until initial amounts and temperature measurements have been verified.

BASIS OF PAYMENT

608-8.1 Payment shall be made at the contract unit price per square yard for the asphalt surface treatment applied and accepted by the Engineer. This price shall be full compensation for all surface preparation, furnishing all materials, delivery and application of these materials, for all labor, equipment, tools, and incidentals necessary to complete the item, all work required to meet AC 150/5320-12, and any costs associated with furnishing a qualified manufacturer's representative to assist with test strips.

Payment will be made under:

Item P-608 Emulsified Asphalt Seal Coat – per square yard

MATERIAL REQUIREMENTS

ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D5	Standard Test Method for Penetration of Bituminous Materials
ASTM D244	Standard Test Methods and Practices for Emulsified Asphalts
ASTM D2007	Standard Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method
ASTM D2042	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
ASTM D2995	Standard Practice for Estimating Application Rate of Bituminous Distributors
ASTM D4402	Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces
AC 150/5320-17	Airfield Pavement Surface Evaluation and Rating (PASER) Manuals
AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements

END OF ITEM P-608

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ITEM P-610
STRUCTURAL PORTLAND CEMENT CONCRETE

DESCRIPTION

610-1.1

This item shall consist of plain structural portland cement concrete, prepared and constructed in accordance with these specifications, at the locations and of the form and dimensions shown on the plans.

MATERIALS

610-2.1 GENERAL.

Only approved materials, conforming to the requirements of these specifications, shall be used in the work. They may be subjected to inspection and tests at any time during the progress of their preparation or use. The source of supply of each of the materials shall be approved by the Engineer before delivery or use is started. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be scored and handled to insure the preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed therein.

In no case shall the use of pit-run or naturally mixed aggregates be permitted. Naturally mixed aggregate shall be screened and washed, and all fine and coarse aggregates shall be stored separately and kept clean. The mixing of different kinds of aggregates from different sources in one storage pile or alternating batches of different aggregates will not be permitted.

- A. Reactivity. Aggregates shall be tested for deleterious reactivity with alkalis in the cement, which may cause excessive expansion of the concrete. Separate tests of coarse and fine aggregate shall be made in accordance with ASTM C 1260. If the expansion of coarse or fine aggregate test specimens, tested in accordance with ASTM C 1260, does not exceed 0.10 % at 28 days (30 days from casting), the coarse or fine aggregates shall be accepted.

If the expansion of any aggregate, coarse or fine, at 28 days is greater than 0.10%, tests of combined materials shall be made in accordance with ASTM C 1567 using the aggregates, cementitious materials, and/or specific reactivity reducing chemicals in the proportions proposed for the mixture design. If the expansion of the proposed combined materials test specimens, tested in accordance with ASTM C 1567, does not exceed 0.10 % at 28 days, the proposed combined materials will be accepted. If the expansion of the proposed combined materials test specimens 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.

610-2.2 COARSE AGGREGATE.

The coarse aggregate for concrete shall meet the requirements of ASTM C 33. Coarse aggregate shall have a durability factor as determined by ASTM C 666 of 95 percent or greater. The Engineer may consider and reserve final approval of other State classification procedures addressing aggregate durability.

Coarse aggregate shall be well graded from coarse to fine and shall meet one of the gradations shown in Table 1, using ASTM C 136.

610-2.3 FINE AGGREGATE.

The fine aggregate for concrete shall meet the requirements of ASTM C 33.

The fine aggregate shall be well graded from fine to coarse and shall meet the requirements of Table 2 when tested in accordance with ASTM C 136:

TABLE 1. GRADATION FOR COARSE AGGREGATE

Sieve Designation (square openings)	Percentage by Weight Passing Sieves						
	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No.4
No. 4 to 3/4 in.			100	90-100		20-55	0-10
No. 4 to 1 in.		100	90-100		25-60		0-10
No. 4 to 1-1/2 in	100	95-100		35-70		10-30	0-5

TABLE 2. GRADATION FOR FINE AGGREGATE

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
3/8 inch	100
No. 4	95-100
No. 16	45-80
No. 30	25-55
No. 50	10-30
No. 100	2-10

Blending will be permitted, if necessary, in order to meet the gradation requirements for fine aggregate. Fine aggregate deficient in the percentage of material passing the No. 50 mesh sieve may be accepted, provided that such deficiency does not exceed 5% and is remedied by the addition of pozzolanic or cementitious materials other than portland cement, as specified in 610-2.6 on admixtures, in sufficient quantity to produce the required workability as approved by the Engineer.

610-2.4 CEMENT.

Cement shall conform to the requirements of ASTM C 150 Type I or II.

The Contractor shall furnish vendors' certified test reports for each carload, or equivalent, of cement shipped to the project. The report shall be delivered to the Engineer before permission to use the cement is granted. All such test reports shall be subject to verification by testing sample materials received for use on the project.

610-2.5 WATER.

The water used in concrete shall be free from sewage, oil, acid, strong alkalis, vegetable matter, and clay and loam. If the water is of questionable quality, it shall be tested in accordance with AASHTO T 26.

610-2.6 ADMIXTURES.

The use of any material added to the concrete mix shall be approved by the Engineer. Before approval of any material, the Contractor shall be required to submit the results of complete physical and chemical analyses made by an acceptable testing laboratory. Subsequent tests shall be made of samples taken by the Engineer from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

Pozzolanic admixtures shall be fly ash or raw or calcined natural pozzolons meeting the requirements of ASTM C 618. Class F or N with the exception of loss of ignition, where the maximum shall be less than 6 percent. Class F or N flyash for use in mitigating alkali-silica reactivity shall have a Calcium Oxide (CaO) content of less than 13 percent and a total equivalent alkali content less than 3 percent.

Air-entraining admixtures shall meet the requirements of ASTM C 260. Air-entraining admixtures shall be added at the mixer in the amount necessary to produce the specified air content.

Water-reducing, set-controlling admixtures shall meet the requirements of ASTM C 494, Type A, water-reducing or Type D, water-reducing and retarding. Water-reducing admixtures shall be added at the mixer separately from air-entraining admixtures in accordance with the manufacturer's printed instructions.

610-2.7 PREMOLDED JOINT MATERIAL.

Premolded joint material for expansion joints shall meet the requirements of ASTM D 1751.

610-2.8 JOINT FILLER.

The filler for joints shall meet the requirements of Item P-605, unless otherwise specified in the proposal.

610-2.9 STEEL REINFORCEMENT.

Reinforcing shall consist of Welded Steel Wire Fabric conforming to the requirements of ASTM A 185.

610-2.10 COVER MATERIALS FOR CURING.

Curing materials shall conform to one of the following specifications:

Waterproof paper for curing concrete	ASTM C 171
Polyethylene Sheeting for Curing Concrete	ASTM C 171
Liquid Membrane-Forming Compounds for Curing Concrete	ASTM C 309, Type 2

CONSTRUCTION METHODS

610-3.1 GENERAL.

The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified herein. All machinery and equipment owned or controlled by the Contractor, which he proposes to use on the work, shall be of sufficient size to meet the requirements of the work, and shall be such as to produce satisfactory work; all work shall be subject to the inspection and approval of the Engineer.

610-3.2 CONCRETE COMPOSITION.

The concrete shall develop a compressive strength of 3,000 psi in 28 days as determined by test cylinders made in accordance with ASTM C 31 and tested in accordance with ASTM C 39. The concrete shall contain not less than 470 pounds of cement per cubic yard. The concrete shall contain 5 percent of entrained air, plus or minus 1 percent, as determined by ASTM C 231 and shall have a slump of not more than 4 inches as determined by ASTM C 143.

610-3.3 ACCEPTANCE SAMPLING AND TESTING.

Concrete for each structure will be accepted on the basis of the compressive strength specified in paragraph 3.2. The concrete shall be sampled in accordance with ASTM C 172. Compressive strength specimens shall be made in accordance with ASTM C 31 and tested in accordance with ASTM C 39.

Concrete cylindrical test specimens shall be made in accordance with ASTM C 31 and tested in accordance with ASTM C 39. The Contractor shall cure and store the test specimens under such conditions as directed.

610-3.4 PROPORTIONING AND MEASURING DEVICES.

When package cement is used, the quantity for each batch shall be equal to one or more whole sacks of cement. The aggregates shall be measured separately by weight. If aggregates are delivered to the mixer in batch trucks, the exact amount for each mixer charge shall be contained in each batch compartment. Weighing boxes or hoppers shall be approved by the Engineer and shall provide means of regulating the flow of aggregates into the batch box so that the required and exact weight of aggregates can be readily obtained.

610-3.5 CONSISTENCY.

The consistency of the concrete shall be checked by the slump test specified in ASTM C 143.

610-3.6 MIXING.

Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C 94.

610-3.7 MIXING CONDITIONS.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F without permission of the Engineer. If permission is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F nor more than 100°F. The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his/her expense.

Retempering of concrete by adding water or any other material shall not be permitted.

The delivery of concrete to the job shall be in such a manner that batches of concrete will be deposited at uninterrupted intervals.

610-3.8 FORMS.

Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the Engineer. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as designed on the plans. The forms shall be

true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The Contractor shall bear responsibility for their adequacy. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes.

The internal ties shall be arranged so that, when the forms are removed, no metal will show in the concrete surface or discolor the surface when exposed to weathering. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied shortly before the concrete is placed. Forms shall be constructed so that they can be removed without injuring the concrete or concrete surface. The forms shall not be removed before the expiration of at least 30 hours from vertical faces, walls, slender columns, and similar structures; forms supported by falsework under slabs, beams, girders, arches, and similar construction shall not be removed until tests indicate that at least 60% of the design strength of the concrete has developed.

610-3.9 PLACING REINFORCEMENT.

All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concreting. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.10 EMBEDDED ITEMS.

Before placing concrete, any items that are to be embedded shall be firmly and securely fastened in place as indicated. All such items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The embedding of wood shall be avoided. The concrete shall be spaded and consolidated around and against embedded items.

610-3.11 PLACING CONCRETE.

All concrete shall be placed during daylight, unless otherwise approved. The concrete shall not be placed until the depth and character of foundation, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved. Concrete shall be placed as soon as practical after mixing and in no case later than 1 hour after water has been added to the mix. The method and manner of placing shall be such to avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. Dropping the concrete a distance of more than 5 feet, or depositing a large quantity at one point, will not be permitted. Concrete shall be placed upon clean, damp surfaces, free from running water, or upon properly consolidated soil.

The concrete shall be compacted with suitable mechanical vibrators operating within the concrete. When necessary, vibrating shall be supplemented by hand spading with suitable tools to assure proper and adequate compaction. Vibrators shall be manipulated so as to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The vibration at any joint shall be of sufficient duration to accomplish compaction but shall not be prolonged to the point where segregation occurs. Concrete deposited under water shall be carefully placed in a compact mass in its final position by means of a tremie, a closed bottom dump bucket, or other approved method and shall not be disturbed after being deposited.

610-3.12 CONSTRUCTION JOINTS.

When the placing of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, such provisions shall be made for grooves, steps, keys, dovetails, reinforcing bars or other devices as may be prescribed. The work shall be arranged so that a section

begun on any day shall be finished during daylight of the same day. Before depositing new concrete on or against concrete that has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly, wetted, and covered with a neat coating of cement paste or grout.

610-3.13 EXPANSION JOINTS.

Expansion joints shall be constructed at such points and of such dimensions as may be indicated on the drawings. The premolded filler shall be cut to the same shape as that of the surfaces being joined. The filler shall be fixed firmly against the surface of the concrete already in place in such manner that it will not be displaced when concrete is deposited against it.

610-3.14 DEFECTIVE WORK.

Any defective work discovered after the forms have been removed shall be immediately removed and replaced. If any dimensions are deficient, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Engineer cannot be repaired satisfactorily, the entire section shall be removed and replaced at the expense of the Contractor.

610-3.15 SURFACE FINISH.

All exposed concrete surfaces shall be true, smooth, and free from open or rough spaces, depressions, or projections. The concrete in horizontal plane surfaces shall be brought flush with the finished top surface at the proper elevation and shall be struck-off with a straightedge and floated. Mortar finishing shall not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.

When directed, the surface finish of exposed concrete shall be a rubbed finish. If forms can be removed while the concrete is still green, the surface shall be pointed and wetted and then rubbed with a wooden float until all irregularities are removed. If the concrete has hardened before being rubbed, a carborundum stone shall be used to finish the surface. When approved, the finishing can be done with a rubbing machine.

610-3.16 CURING AND PROTECTION.

All concrete shall be properly cured and protected by the Contractor. The work shall be protected from the elements, flowing water, and from defacement of any nature during the building operations. The concrete shall be cured as soon as it has sufficiently hardened by covering with an approved material. Water-absorptive coverings shall be thoroughly saturated when placed and kept saturated for a period of at least 3 days. All curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to currents of air. Where wooden forms are used, they shall be kept wet at all times until removed to prevent the opening of joints and drying out of the concrete. Traffic shall not be allowed on concrete surfaces for 7 days after the concrete has been placed.

610-3.17 DRAINS OR DUCTS.

Drainage pipes, conduits, and ducts that are to be encased in concrete shall be installed by the Contractor before the concrete is placed. The pipe shall be held rigidly so that it will not be displaced or moved during the placing of the concrete.

610-3.18 COLD WEATHER PROTECTION.

When concrete is placed at temperatures below 40°F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing. The aggregates, or water, or both, shall be heated in order to place the concrete at temperatures between 50°F and 100°F.

Calcium chloride may be incorporated in the mixing water when directed by the Engineer. Not more than 2 pounds of Type 1 nor more than 1.6 pounds of Type 2 shall be added per bag of cement. After the concrete has been placed, the Contractor shall provide sufficient protection such as cover, canvas, framework, heating apparatus, etc., to enclose and protect the structure and maintain the temperature of the mix at not less than 50°F until at least 60% of the designed strength has been attained.

610-3.19 FILLING JOINTS.

All joints that require filling shall be thoroughly cleaned, and any excess mortar or concrete shall be cut out with proper tools. Joint filling shall not be started until after final curing and shall be done only when the concrete is completely dry. The cleaning and filling shall be carefully done with proper equipment and in a manner to obtain a neat looking joint free from excess filler.

METHOD OF MEASUREMENT

610-4.1

Portland cement concrete shall not be measured for payment.

BASIS OF PAYMENT

610-5.1

No direct payment shall be made for structural Portland cement concrete. The costs for furnishing all materials and for all preparation, delivery and installation of these materials and all labor, equipment, tools and incidentals shall be incidental to and included in other Contract Unit Prices for items requiring concrete.

TESTING REQUIREMENTS

ASTM C 31	Making and Curing Test Specimens in the Field
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 138	Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C 143	Slump of Hydraulic Cement Concrete
ASTM C 231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 666	Resistance of Concrete to Rapid Freezing and Thawing
ASTM C 1077	Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1260	Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

MATERIAL REQUIREMENTS

ASTM A 184	Specification for Fabricated Deformed Steel Bar or Rod Mats for Concrete Reinforcement
ASTM A 185	Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 497	Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 704	Welded Steel Plain Bars or Rod Mats for Concrete Reinforcement
ASTM C 33	Concrete Aggregates
ASTM C 94	Ready-Mixed Concrete
ASTM C 150	Portland Cement
ASTM C 171	Sheet Materials for Curing Concrete
ASTM C 172	Sampling Freshly Mixed Concrete
ASTM C 260	Air-Entraining Admixtures for Concrete
ASTM C 309	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494	Chemical Admixtures for Concrete
ASTM C 595	Blended Hydraulic Cements
ASTM C 618	Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM D 1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
ASTM D 1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
AASHTO T 26	Quality of Water to be Used in Concrete

END OF ITEM P-610

**ITEM P-620
RUNWAY AND TAXIWAY PAINTING**

DESCRIPTION

620-1.1

This item shall consist of the painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer.

MATERIALS

620-2.1 MATERIALS ACCEPTANCE.

The Contractor shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site.

620-2.2 PAINT.

Paint shall be Waterborne or Solvent-base in accordance with the requirements of paragraph 620-2.2 A or D. Paint shall be furnished in White-37925, Yellow-33538 or 33644, Red-31136, and Black-37038 in accordance with Federal Standard No. 595.

a. WATERBORNE. Paint shall meet the requirements of Federal Specification TT-P-1952E, Type II.

b. EPOXY. (DELETED)

c. METHACRYLATE. (DELETED)

d. SOLVENT-BASE. Paint shall meet the requirements of Federal Specification Type I.

e. PREFORMED THERMOPLASTIC AIRPORT PAVEMENT MARKINGS. (Deleted)

620-2.3 REFLECTIVE MEDIA.

Glass beads shall meet the requirements for Federal Specification TT-B-1325D Type I, gradation A or TT-B-1325D, Type III as indicated on the plans. 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.

CONSTRUCTION METHODS

620-3.1 WEATHER LIMITATIONS.

The painting shall be performed only when the surface is dry and when the surface temperature is at least 45°F and rising and the pavement surface temperature is at least 5°F above the dew point. Markings shall not be applied when the pavement temperature is greater than 120°F.

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 suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray.

620-3.3 PREPARATION OF SURFACE.

Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material that would reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials without damage to the pavement surface. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer.

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.

Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the Engineer. The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet and marking dimensions and spacings shall be within the following tolerances:

Dimension and Spacing	Tolerance
36 inches or less	±1/2 inch
greater than 36 inches to 6 feet	± 1 inch
greater than 6 feet to 60 feet	± 2 inches
greater than 60 feet	± 3 inches

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate(s) shown in Table 1. The addition of thinner will not be permitted. A temporary coat of paint shall be applied within 24 hours of a bituminous surface course or seal coat in order to re-open the associated portion of the airport.

TABLE 1. APPLICATION RATES FOR PAINT AND GLASS BEADS

Paint Type	Paint Square feet per gallon, ft ² /gal	Glass Beads, Type III - Gradation A Pounds per gallon of paint—lb./gal.
Temporary	345 ft ² /gal. maximum	Not Required
Waterborne	115 ft ² /gal. maximum	10 lb./gal. minimum
Solvent Base	115 ft ² /gal. maximum	10 lb./gal. minimum

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(s) shown in Table 1. Glass beads shall not be applied to black paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made.

All emptied containers shall be returned to the paint storage area for checking by the Engineer. The containers shall not be removed from the airport or destroyed until authorized by the Engineer.

The Contractor shall apply the paint in a two part process. The temporary paint coat shall be applied as soon as possible after paving or asphalt maintenance. The final paint coat shall be applied 24-30 days following the temporary paint coat.

620-3.6 APPLICATION--PREFORMED AIRPORT PAVEMENT MARKINGS. (Deleted)

620-3.7 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 or unadhered reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the Engineer. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and Federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1

The quantity of runway and taxiway markings to be paid for shall be the number of square feet of painting, the number of pounds of reflective media, the number of square feet of marking removal performed in accordance with the specifications and accepted by the Engineer.

BASIS OF PAYMENT

620-5.1

Payment shall be made at the respective contract price per square foot for runway and taxiway painting, price per pound for reflective media and price per square foot for marking removal. 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	Taxiway Painting - per square foot
Item P-620b	Reflective Media, Type III - per pound
Item P-620c	Marking Removal - per square foot

TESTING REQUIREMENTS

ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 146	Chemical Analysis of Glass Sand
ASTM C 371	Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders
ASTM D 92	Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D 711	No-Pick-Up Time of Traffic Paint
ASTM D 968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 1213-54(1975)	Test Method for Crushing Resistance of Glass Spheres
ASTM D 1652	Test Method for Epoxy Content of Epoxy Resins
ASTM D 2074	Test Method for Total Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D 2240	Test Method for Rubber Products-Durometer Hardness
ASTM G 15453	Operating Light and Water-Exposure Apparatus (Fluorescent Light Apparatus UV-Condensation Type) for Exposure of Nonmetallic Materials.
Federal Test Method	Paint, Varnish, Lacquer and Related Materials; Methods of Inspection,
Standard No. 141D/GEN	Sampling and Testing

MATERIAL REQUIREMENTS

ASTM D 476	Specifications for Dry Pigmentary Titanium Dioxide Pigments Products
Code of Federal Regulations	40 CFR Part 60, Appendix A – Definition of Traverse Point Number and Location
Code of Federal Regulations	29 CFR Part 1910.1200 – Hazard Communications
FED SPEC TT-B-1325D	Beads (Glass Spheres) Retroreflective
AASHTO M 247	Glass Beads Used in Traffic Paints
FED SPEC TT-P-1952E	Paint, Traffic and Airfield Marking, Waterborne
Commercial Item Description (CID) A-A-2886B	Paint, Traffic, Solvent Based
FED STD 595	Colors used in Government Procurement

END OF ITEM P-620

ITEM P-629
THERMOPLASTIC COAL TAR EMULSION SURFACE TREATMENTS

DESCRIPTION

629-1.1. This item shall consist of an application of a thermoplastic resin coal tar emulsion Spray Seal Coat, applied to an existing, previously prepared asphalt surface, including airport pavements serving small airplanes, roads, and other general applications. Thermoplastic resin coal tar emulsion products provide a fuel-resistant surface where pavements are subjected to fuel spills. Thermoplastic resin coal tar emulsion products assist in pavement preservation through reducing the rate of pavement oxidation. The application of the surface treatment shall be in accordance with these specifications and shall conform to the dimensions shown on the plans or as directed by the Engineer.

MATERIALS

629-2.1 THERMOPLASTIC COAL TAR EMULSION. The emulsion material shall be a thermoplastic coal tar emulsion made up of plastic resin and emulsified coal tar pitch. The thermoplastic coal tar emulsion shall be manufactured as a complete product and tested at the manufacturing plant for material certification. The water content of the emulsion shall not exceed 48% \pm 1% when tested in accordance with ASTM D244, paragraph 3.

A dried film shall contain a minimum of 89% of a combination of plastic resin and coal tar with the remaining percentage being inorganic filler. The dried emulsion shall have a softening point greater than 212°F (100°C) when tested in accordance with ASTM D36. A film of the dried emulsion material, 8 mils thick, shall stretch to five (5) times its original length at 70°F (21°C) without breaking, and recover 35% of this length in one minute.

629-2.2 MATERIAL CERTIFICATION. The Contractor shall furnish the manufacturer's certification that each consignment of thermoplastic coal tar emulsion shipped to the project meets the requirements indicated in 629-2.1 and elsewhere in this specification. The Certification shall include actual results of each test and date of when test was performed. The Contractor shall submit a certification that the material proposed has been in field use for a minimum of two (2) years.

629-2.3 FUEL RESISTANCE TESTING. The cured thermoplastic coal tar emulsion sample must pass the fuel-resistance test outlined in Appendix A.

629-2.4 WATER. The water used in mixing shall be potable and free from harmful soluble salts. The temperature of the water added during mixing shall be at least 50°F (10°C). The pH of the water added during mixing shall conform to the requirements of the thermoplastic coal tar emulsion manufacturer.

629-2.5 HANDLING AND STORAGE. The mixture shall be continuously agitated from the time it had been mixed until its application on the pavement surface. The distributor or applicator, pumps and all tools shall be maintained in satisfactory working condition. Spray bar nozzles, pumps, or other equipment can be cleaned mechanically or with clean water.

629-2.6 HEALTH, SAFETY, AND ENVIRONMENT. The Contractor must provide a complete Material Safety Data Sheet (MSDS) in accordance with U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), Regulations (Standards – 29 CFR), 1910.1200 which

establishes the requirement and minimum information for the MSDS for hazardous materials. The MSDS, Section II, shall include the Chemical Abstracts Service (CAS) registry numbers for all applicable hazardous ingredients in the coal tar emulsion product. The Contractor must provide the manufacturer's certification that the product complies with the Code of Federal Regulation (CFR) Title 40 – Protection of Environment. The manufacturer's certification shall address compliance for Air Programs, Part 59, National Volatile Organic Compound Emission Standards for Consumer and Commercial Products (for the airport location) and Water Programs, Part 116, Designation of Hazardous Substances.

COMPOSITION AND APPLICATION

629-3.0 THERMOPLASTIC COAL TAR EMULSION SPRAY SEAL COAT WITH SAND AGGREGATE

629-3.1 QUANTITIES OF MATERIALS PER SQUARE YARD. Based on the data in this specification, the Contractor shall submit the proportions of water, thermoplastic coal tar emulsion, and aggregate proposed for use to the Engineer for approval prior to the start of operations. A copy of the test data required by this specification shall be submitted to the Engineer for approval along with the above information. No thermoplastic coal tar emulsion spray seal coat shall be produced for payment until approved in writing by the Engineer.

APPLICATION RATE WITHOUT AGGREGATE

Composition	Application Rate gal/yd² (L/m²)
75% thermoplastic coal tar emulsion and 25% water (±5%)	0.15-0.25 (0.081-0.136)

APPLICATION RATE WITH AGGREGATE

Application Coat(s)	Composition ⁱ lbs/gal (kg/L)	Application Rate ⁱⁱ Per Coat gal/yd² (L/m²)	Total Application Rate ⁱⁱ gal/yd² (L/m²)
1	6 (0.72)	0.20-0.30 (0.76-1.14)"	0.20-0.30 (0.76-1.14)"
2	3 (0.36)	0.10-0.15 (0.38-0.57)	0.20-0.30 (0.76-1.14)"

- i. Aggregate (lbs) shall be mixed with the undiluted thermoplastic coal tar emulsion (gals).
- ii. Minimum application rate of uncured thermoplastic coal tar emulsion spray seal coat.

629-3.2 AGGREGATE. The aggregate material shall be a dry, clean, dust and dirt free, sound, durable, angular shaped manufactured specialty sand, such as that used as an abrasive, with a Mohs hardness of 6 to 8. The Contractor shall submit manufacturer's technical data and a manufacturer's certification indicating that the specialty sand meets the requirements of the specification to the Engineer prior to bid. The sand must be approved for use by the Engineer and shall meet the following gradation limits:

AGGREGATE MATERIAL GRADATION REQUIREMENTS

Sieve Designation (square openings)	Percentage by Weight Retained Sieves
No. 20 (0.84 mm)	0-2
No. 30 (0.60 mm)	0-12
No. 40 (0.42 mm)	2-60
No. 50 (0.30 mm)	5-60
No. 70 (0.21 mm)	5-60
No. 100 (0.15 mm)	5-30
No. 140 (0.106 mm)	0-10
No. 200 (0.07 mm)	0-2
Finer than No. 200	0-0.3

The Contractor shall provide a certification showing particle size analysis and properties of the material delivered for use on the project. The Contractor's certification may be subject to verification by testing the material delivered for use on the project.

629-3.3 APPLICATION.

a. Pavement surfaces which have excessive runoff of seal coat due to excessive amount of material being applied or excessive surface grade shall be treated in two or more applications to the specified application rate at no additional cost to the Owner. Each additional application shall be performed after the prior application of material has penetrated into the pavement.

If low spots and depressions greater than 1/2 inch (12 mm) in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be broomed with a broom drag. Brooming shall continue until the pavement surface is free of any pools of excess material. Ponding and/or puddling shall not cause excessive pavement softening and/or additional distress. The Engineer shall inspect and approve areas after brooming.

During all applications, the surfaces of adjacent structures shall be protected to prevent their being spattered or marred. Thermoplastic coal tar emulsion materials shall not be discharged into borrow pits or gutters.

629-3.4 FRICTION CHARACTERISTICS. For projects where thermoplastic coal tar emulsion spray seal coat is applied on runway and taxiway surfaces, the Contractor shall submit to the Engineer friction tests, from previous airport projects which used the thermoplastic coal tar emulsion spray seal coat in a similar environment, in accordance with AC 150/5320-12, at 40 or 60 mph (65 or 95 km/h) wet, showing, as a minimum; friction value of pavement surface prior to thermoplastic coal tar emulsion spray seal coat application; two values, tested between 24 and 96 hours after application, with a minimum of 24 hours between tests; and one value tested at no less than 180 days or greater than 360 days after the thermoplastic coal tar emulsion spray seal coat application. The results of the two tests between 24 and 96 hours shall indicate friction is increasing at a rate to obtain similar friction value of the pavement surface prior to application, and the long term test shall indicate no apparent adverse effect with time relative to friction values and existing pavement surface. The Contractor shall submit to the Engineer a list of airports which meet the above requirements, as well as technical details on application rates, aggregate rates, and point of contact at these airports to confirm use and success of thermoplastic coal tar emulsion spray seal coat with aggregate. Friction tests shall be submitted from no less than one of the airports on the list and each set of tests described above, must be from one project.

The thermoplastic coal tar emulsion spray seal coat submittal without the required friction performance will not be approved. Friction tests performed on this project cannot be used as a substitute of this requirement.

CONSTRUCTION METHODS

629-4.1 WORKER SAFETY. The thermoplastic coal tar emulsion surface treatment product shall be handled with caution. The Contractor shall obtain a MSDS for both the thermoplastic coal tar emulsion product and sand and require workmen to follow the manufacturer's recommended safety precautions.

629-4.2 WEATHER LIMITATIONS. The material shall not be applied when the humidity or impending weather conditions will not allow proper drying or when the atmospheric or pavement temperature is below 50°F (10°C), unless otherwise directed by the Engineer.

During application of thermoplastic coal tar emulsion surface treatment, account for wind drift. Cover existing buildings, structures, runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers as necessary to protect against overspray before applying the emulsion. Should thermoplastic coal tar emulsion surface treatment get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the Engineer, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

629-4.3 APPLICATION EQUIPMENT

a. Mobile mixing machine. The mobile mixing machine shall be a truck-mounted mobile mixing plant with a towed-type spreader box. It shall have a water tank and water pump capable of delivering a constant volume of water.

The mobile mixing machine shall have an agitated storage tank for the thermoplastic coal tar emulsion and a non-shearing peristaltic pump with variable rate of flow for the delivery of this material. The mobile mixing machine shall have a hopper for holding aggregate, supplying this material to the mixing chamber by a conveyor belt. The rate of aggregate delivery shall be volumetrically controlled by an adjustable gate opening. The speed of the conveyor shall be mechanically dependent upon the speed of the peristaltic pump.

The mobile mixing machine shall be a continuous-flow mixing unit capable of delivering predetermined quantities of thermoplastic coal tar emulsion, aggregate, and if necessary water, to the mixing chamber and discharging the thoroughly mixed material on a continuous basis. The mobile mixing machine shall deliver the materials to the mixing chamber in a constant proportion in a manner not dependent on power plant or vehicle speed. The machine shall be equipped with a water spray bar capable of fogging the pavement surface to aid in the application process.

Attached to the mixing machine shall be a mechanical-type squeegee distributor, equipped with flexible material in contact with the surface to prevent loss of material from the distributor. It shall be maintained to prevent loss of micro-surfacing on varying grades and adjusted to assure uniform spread. The spreader box may have an adjustable width.

b. Batch mixing machine. The batch-mixing machine shall be either a truck-mounted 500 to 3,000 gallon (1893 to 11356 liter) tank or a self-propelled batch mixing machine 300 to 1000 gallons (1136 to 3785 liters) containing suitably driven mixing blades to combine predetermined

quantities of thermoplastic emulsion, aggregate if specified and if necessary, water into a homogeneous mixture. It shall be equipped with a water tank and diaphragm style pump capable of delivering a constant volume of material to a spray wand or spray bar. The device shall have a bottom ball valve of 3 inches (75 mm) diameter capable of delivering material to a squeegee spreader or a drag box.

c. Auxiliary equipment. Other tools or equipment such as power brooms, power blowers, air compressors, hand brooms, hand squeegees, etc., shall be provided as required.

629-4.4 TEST AREAS AND TEST SECTIONS. A qualified manufacturer's representative shall be present in the field to assist the Contractor in applying test areas and/or test sections to determine the optimum application rate. A test area and/or section shall be applied for each differing hot mix asphalt (HMA) pavement surface identified in the project. The test area(s) and/or test section(s) shall be used to determine the material application rate(s) prior to full production. The same equipment and method of operation shall be utilized on the test area(s) and/or test section(s) as will be utilized on the remainder of the work.

a. For Taxiway, taxilane and apron surfaces. Prior to full application, the Contractor shall place test areas at varying application rates as specified by the manufacturer's representative and Engineer to determine application rate(s). The test areas will be located on representative section(s) of the pavement to receive the Thermoplastic coal tar emulsion spray seal coat designated by the Engineer.

b. For spray seal coat on runway and taxiway surfaces. Prior to full application, the Contractor shall place a series of test sections a minimum of 300 feet (90 m) long by 12 feet (3.6 m) wide, or width of anticipated application, whichever is greater, at varying application rates as stipulated by the manufacturer's representative and Engineer to determine application rate(s). The area to be tested will be located on a representative section of the pavement to receive the Thermoplastic coal tar emulsion spray seal coat designated by the Engineer. Before beginning the test section(s), the skid resistance of the existing pavement shall be determined for each test section with a continuous friction measuring equipment (CFME). The skid resistance test after application shall be at approximately the same location as the test done on the existing pavement. The Contractor may begin testing the skid resistance of runway and taxiway test sections after application of the Thermoplastic coal tar emulsion spray seal has fully cured. Aircraft shall not be permitted on the runway or taxiway test sections for a minimum of 24 hours and until such time as the Contractor validates that its surface friction meets AC 150/5320-12. The results of the friction evaluation meet or exceed the Maintenance Planning levels provided in Table 3-2, "Friction Level Classification for Runway Pavement Surfaces," in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid-resistant Airport Pavement Surfaces, when tested at speeds of 40 and 60 mph (65 and 95 km/h) wet with approved CFME.

If the test section should prove to be unsatisfactory, necessary adjustments to the application rate, placement operations, and equipment shall be made. Additional test sections shall be placed and additional skid resistance tests performed and evaluated. Full production shall not begin without the Engineer's approval of an appropriate application rate(s). Acceptable test sections shall be paid for in accordance with paragraph 629-8.1.

629-4.5 PREPARATION OF ASPHALT PAVEMENT SURFACES. Clean pavement surface immediately prior to placing the seal coat by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease that has not penetrated the asphalt

pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with the oil spot primer. Any additional surface preparation, such as crack repair, shall be in accordance with paragraph 101-3.6.

629-4.6 APPLICATION. Application shall be in accordance with paragraph 629-3.3.

629-4.7 CURING. The mixture shall be permitted to dry for a minimum of 24 hours after the application, before opening to traffic or painting, and shall be sufficiently cured to drive over without damage to the installation. Any damage to the uncured mixture will be the responsibility of the Contractor to repair.

QUALITY CONTROL

629-5.1 MANUFACTURER'S REPRESENTATION. The manufacturer's representative shall have knowledge of the material, procedures, and equipment described in the specification and shall be responsible for determining the application rates and shall oversee the preparation and application of the thermoplastic coal tar emulsion surface treatment. Documentation of the manufacturer representative's experience and knowledge for applying the thermoplastic coal tar emulsion surface treatment shall be furnished to the Engineer a minimum of 10 work days prior to placement of the test sections. The cost of the manufacturer's representative shall be included in the bid price.

629-5.2 CONTRACTOR QUALIFICATIONS. The Contractor shall provide the Engineer contractor qualifications for applicators, personnel and equipment. The Contractor shall also provide, from the thermoplastic coal tar emulsion Manufacturer, documentation that the Contractor is certified to apply the thermoplastic coal tar emulsion surface treatment. Contractor shall provide documentation for at least three (3) applications similar to this project completed in the past two (2) years.

MATERIAL ACCEPTANCE

629-6.1 FRICTION TESTS. Friction Test in accordance with AC 150/5320-12, Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces, shall be accomplished on all runway and taxiways that have received a seal coat. The Contractor shall coordinate testing with the Engineer. Each test includes performing friction tests at 40 mph and 60 mph (65 and 95 km/h) both wet, 15 feet (4.5 m) to each side of runway centerline. Friction test shall be run within 30 days prior to application of the seal coat to runway and/or high-speed taxiways and after application of the seal coat. The Engineer shall be present for testing. The Contractor shall provide a written report of friction test results.

METHOD OF MEASUREMENT

629-7.1 MEASUREMENT. The Thermoplastic Coal Tar Emulsion Spray Seal Coat with Sand Aggregate shall be measured by the actual square yardage of the area indicated on the contract drawings or designated by the Engineer.

BASIS OF PAYMENT

629-8.1 PAYMENT. Payment shall be made at the contract unit price per square yard (square meter) for the Thermoplastic Coal Tar Emulsion Spray Seal Coat with Sand Aggregate. This price shall fully compensate the Contractor for furnishing all materials and for all labor, equipment tools

and incidentals necessary to complete the thermoplastic coal tar emulsion product installation, including mix design and data sheets stipulated in these specifications.

Payments will be made under:

Item P-629-8.1 Thermoplastic Coal Tar Emulsion Spray Seal Coat with Sand Aggregate –per square yard.

TESTING REQUIREMENTS

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

29 CFR Part 1910.1200 Hazard Communication

ASTM C67	Standard Test Method for Sampling and Testing Brick and Structural Clay Tile
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM D3699	Standard Specification for Kerosene
ASTM D36	Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
ASTM D244	Standard Test Methods and Practices for Emulsified Asphalts
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces
AC 150/5320-17	Airfield Pavement Surface Evaluation and Rating (PASER) Manuals

APPENDIX A

FUEL RESISTANCE TEST TEST METHODS CRITERION

1. Scope

This method determines the resistance of the thermoplastic coal tar emulsion surface treatment to kerosene.

2. Apparatus

- 2.1 Two 6" × 6" (150 mm × 150 mm) square 16 gauge sheet metal masks with a 4" × 4" (100 mm × 100 mm) square center removed.
- 2.2 6" × 6" (150 mm × 150 mm) unglazed white ceramic tile with an absorption rate of 10-18% (determined in accordance with ASTM C67).
- 2.3 Brass ring, 2" (50 mm) diameter and 2" (50 mm) high.
- 2.4 Kerosene meeting requirements of ASTM D3699.
- 2.5 Silicone rubber sealant.

3. Procedure

- 3.1 Immerse the ceramic tile in distilled water for a minimum of ten minutes.
- 3.2 Remove excess water from the tile to produce a damp surface before applying the thermoplastic coal tar emulsion surface treatment.
- 3.3 Using the mask described in 2.1 apply thermoplastic coal tar emulsion surface treatment as specified to the tile. Spread even with the top of the mask using a spatula or other straightedge.
- 3.4 Allow the sample to cure for 96 hours at 77 ±2°F. and 50 ±10% relative humidity.
- 3.5 After curing, affix the brass ring to the thermoplastic coal tar emulsion surface treatment on the tile with silicone rubber sealant.
- 3.6 Fill the brass ring with kerosene.
- 3.7 After 24 hours, remove the kerosene from the brass ring, blot dry and immediately examine the film for softness and loss of adhesion. Immediately after the film is examined, break the tile in half, exposing that part of the tile whose film was subjected to the kerosene.
- 3.8 Evaluate for penetration of kerosene through the thermoplastic coal tar emulsion surface treatment and loss of adhesion.

4. Report

- 4.1 Report the results as pass or fail. Visible evidence of leakage or discoloration shall constitute failure of the fuel resistance test.

5. Criterion: A "pass" rating in the fuel resistance test is required prior to full production.

END OF ITEM P-629

**ITEM D-705
PIPE UNDERDRAINS FOR AIRPORTS**

DESCRIPTION

705-1.1

This item shall consist of the construction of pipe drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

705-2.1 GENERAL.

Materials shall meet the requirements shown on the plans and specified below.

705-2.2 PIPE.

The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements.

Smooth-Wall Perforated PVC Pipe	ASTM F 758
Poly (Vinyl Chloride)(PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings	ASTM F 949
Corrugated Polyethylene Drainage Tubing (all types)	AASHTO M 252

705-2.3 JOINT MORTAR. (DELETED)

705-2.4 ELASTOMERIC SEALS.

Elastomeric seals shall conform to the requirements of ASTM F 477.

705-2.5 POROUS BACKFILL.

Porous backfill shall be free of clay, humus, or other objectionable matter, and shall conform to the gradation in Table 1 when tested in accordance with ASTM C 136.

TABLE 1. GRADATION OF POROUS BACKFILL

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
	Porous Material No. 2
1-1/2 inch	100
1 inch	90 - 100
3/8 inch	25 - 60
No. 4	5 - 40
No. 8	0 - 20
No. 16	
No. 50	
No. 100	

705-2.6. GRANULAR MATERIAL. (DELETED)

705-2.7. FILTER FABRIC.

The filter fabric shall conform to the requirements of AASHTO M 288-99, Class 2.

TABLE 2		
Fabric Property	Test Method	Test Requirement
Grab Tensile Strength, lbs	ASTM D 4632	125 min
Grab Tensile Elongation %	ASTM D 4632	50 min
Burst Strength, psi	ASTM D 3785	125 min
Trapezoid Tear Strength, lbs	ASTM D 4533	55 min
Puncture Strength, lbs	ASTM D 4833	40 min
Abrasion, lbs	ASTM D 4886	15 max loss
Equivalent Opening Size	ASTM D 4751	70-100
Permittivity sec ⁻¹	ASTM D 4491	0.80
Accelerated Weathering	ASTM D 4355	70
(UV Stability)	*(500 hrs exposure)	
(Strength Retained - %)		

705-2.8. CONTROLLED LOW STRENGTH MATERIAL (CLSM). (DELETED)

CONSTRUCTION METHODS

705-3.1 EQUIPMENT.

All equipment necessary and required for the proper construction of pipe underdrains shall be on the project, in first-class working condition, and approved by the Engineer before construction is permitted to start.

705-3.2 EXCAVATION.

The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but shall not be less than the external diameter of the pipe plus 6 inches on each side. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 4 inches. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The Engineer shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the Engineer. The excavation shall not be carried below the required depth; when this is done, the trench shall be backfilled at the Contractor's expense with material approved by the Engineer and compacted to the density of the surrounding earth material.

The bed for the pipe shall be so shaped that at least the lower quarter of the pipe shall be in continuous contact with the bottom of the trench. Spaces for the pipe bell shall be excavated accurately to size to clear the bell so that the barrel supports the entire weight of the pipe.

The Contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. Unless otherwise provided, the bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the backfill to at least 12 inches over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot for the pipe.

705-3.3 LAYING AND INSTALLING PIPE.

a. Concrete Pipe. (DELETED)

b. Metal Pipe. (DELETED)

c. PVC or Polyethylene Pipe. PVC or polyethylene pipe shall be installed in accordance with the requirements of ASTM D 2321 or AASHTO Standard Specification for Highway Bridges Section 30. Perforations shall meet the requirements of AASHTO M 252 or M 294 Class 2, unless otherwise indicated on the plans. The pipe shall be laid accurately to line and grade.

d. All Types of Pipe. The upgrade end of pipelines, not terminating in a structure, shall be plugged or capped as approved by the Engineer.

Pipe outlets for the underdrains shall be constructed when required or shown on the plans. The pipe shall be laid with tight-fitting joints. Porous backfill is not required around or over pipe outlets for underdrains. All connections to other drainage pipes or structures shall be made as required and in a satisfactory manner. If connections are not made to other pipes or structures, the outlets shall be protected and constructed as shown on the plans.

e. Filter Fabric. The filter fabric shall be installed in accordance with the manufacturer's recommendations, or in accordance with AASHTO M 288-99 APPENDIX, unless otherwise shown on the plans.

705-3.4 MORTAR. (DELETED)

705-3.5 JOINTS IN CONCRETE PIPE. (DELETED)

705-3.6 BACKFILLING.

a. Earth. All trenches and excavations shall be backfilled within a reasonable time after the pipes are installed, unless other protection of the pipe is directed. The backfill material shall be selected material from excavation or borrow; material which is placed within a nominal pipe diameter distance at the sides of the pipe and 1 foot over the top shall be material that can be readily compacted. It shall not contain stones retained on a 3-inch sieve, frozen lumps, chunks of highly plastic clay, or any other material that is objectionable to the Engineer. The material shall be moistened or dried, if necessary to be compacted by the method in use. Backfill material shall be approved by the Engineer. Special care shall be taken in placing the backfill.

Great care shall be used to obtain thorough compaction under the haunches and along the sides to the top of the pipe.

The backfill shall be placed in loose layers not exceeding 6 inches in depth under and around the pipe, and not exceeding 8 inches over the pipe. Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the Engineer, until the trench is completely filled and brought to the proper elevation. Backfilling shall be done in a manner to avoid injurious top or side pressures on the pipe.

In embankments and for other areas outside of pavements, the backfill shall be compacted to the density required for embankments in unpaved areas under Item P-152. Under paved areas, the subgrade and any backfill shall be compacted to the density required for embankments for paved areas under Item P-152.

b. Granular Material.

Porous backfill shall be placed prior to the completion of grading or subgrade operations, the backfill material shall be placed immediately after laying the pipe. The depth of this granular backfill shall be not less than 12 inches, measured from the top of the underdrain. During subsequent construction operations, this minimum backfill of 12 inches of depth shall not be disturbed until such time as the underdrains are to be completed. When the underdrains are to be completed, the unsuitable material shall be removed until the porous backfill is exposed. That part of the porous backfill that contains objectionable material shall be removed and replaced with suitable material. The cost of removing and replacing any such unsuitable material shall be borne by the Contractor.

c. Controlled Low Strength Material (CLSM). (DELETED)

d. Deflection Testing. The Engineer may at any time, notwithstanding previous material acceptance, reject or require re-installation of pipe that exceeds 5 percent deflection when measured in accordance with ASTM D 2321, including Appendices.

705-3.7 CONNECTIONS. When the plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made so that a smooth uniform flow line will be obtained throughout the drainage system.

705-3.8 CLEANING AND RESTORATION OF SITE. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as ordered by the Engineer. Except for paved areas of the airport, the Contractor shall restore all disturbed areas to their original condition.

METHOD OF MEASUREMENT

705-4.1

The length of pipe to be paid for shall be the number of linear feet of pipe underdrains in place, completed, and approved; measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types, and sizes shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipeline being measured.

BASIS OF PAYMENT

705-5.1

Payment will be made at the contract unit price per linear foot complete, including porous backfill and filter fabric. These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- Item D-705a 6 Inch Pipe Underdrain - per linear foot
- Item D-705b 6 Inch Storm Sewer PVC Pipe - per linear foot

MATERIAL REQUIREMENTS

ASTM A 760	Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 762	Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 144	Aggregate for Masonry Mortar
ASTM C 150	Portland Cement
ASTM C 444	Perforated Concrete Pipe
ASTM C 654	Porous Concrete Pipe
ASTM D 2321	Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 3034	Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F 477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 758	Smooth-Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F 794	Poly (Vinyl Chloride) Ribbed Drain Pipe & Fittings Based on Controlled Inside Diameter
ASTM F 949	Poly (Vinyl Chloride)(PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
AASHTO M 190	Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 196	Corrugated Aluminum Alloy Culverts and Underdrains
AASHTO M 252	Corrugated Polyethylene Drainage Tubing

AASHTO M 288-99	Geotextile Specification for Highway Applications
AASHTO M 294M	Corrugated Polyethylene Pipe, 300 to 1200 mm Diameter
AASHTO M 304	Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO	Standard Specifications for Highway Bridges

END OF ITEM D-705

**ITEM T-901
SEEDING**

DESCRIPTION

901-1.1

This item shall consist of soil preparation, seeding the areas shown on the plans or as directed by the Engineer in accordance with these specifications.

MATERIALS

901-2.1 SEED.

The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Fed. Spec. JJJ-S-181.

Seed shall be furnished separately or in mixtures in standard containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 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.

Seeds shall be applied as follows:

Seed	Variety	%	Rate of Application lbs. pure live seed/acre
Galleta, Floret	Viva	20%	1.10
Indian Ricegrass	Paloma	20%	1.09
Grama Sideoats	--	20%	0.91
Alkali Sacaton	Salado	20%	0.10
Grama, Blue	Hachita	20%	0.23
TOTAL		100%	3.43

Straw* 4,000 lb. per acre

*Shall contain 60 lb. of tackifier/ton of fiber

Seeding shall be performed during the period between June 15 and August 1 or January 1 and May 1 inclusive, unless otherwise approved by the Engineer.

901-2.2 LIME. (DELETED)

901-2.3 FERTILIZER. (DELETED)

901-2.4 SOIL FOR REPAIRS.

The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

CONSTRUCTION METHODS

901-3.1 ADVANCE PREPARATION AND CLEANUP.

After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches as a result of grading operations and, if immediately prior to seeding, the top 3 inches of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

However, when the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches. Clods shall be broken and the top 3 inches of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 DRY APPLICATION METHOD.

a. Liming. (DELETED)

b. Fertilizing. (DELETED)

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing, and the fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawnroller, weighing 40 to 65 pounds per foot of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot of width for sandy or light soils.

901-3.3 WET APPLICATION METHOD.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet. One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds of lime shall be added to and mixed with each 100 gallons of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches, after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to insure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 MAINTENANCE OF SEEDED AREAS.

The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. A grass stand shall be considered adequate when bare spots are one square foot or less, randomly dispersed, and do not exceed 3% of the area seeded. If at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density, and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded out of season will be withheld until such time as these requirements have been met.

METHOD OF MEASUREMENT

901-4.1 The quantity of seeding to be paid for shall be the number of units of acres measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

901-5.1

Payment shall be made at the contract unit price per acre or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item T-901	Seeding - per acre
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MATERIAL REQUIREMENTS

ASTM C 602	Agricultural Liming Materials
ASTM D 977	Emulsified Asphalt
FED SPEC A-A-1909	Fertilizer
FED SPEC JJJ-S-181	Seeds, Agriculture

END OF ITEM T-901

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ITEM L-108
UNDERGROUND POWER CABLE FOR AIRPORTS

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables direct buried and furnishing and/or installing power cables within conduit or duct banks-in accordance with 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 Engineer. 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 any cable for FAA facilities. Requirements and payment for trenching and backfilling for the installation of underground conduit and duct banks are covered under Item L-110 "Airport Underground Electrical Duct Banks and Conduits."

EQUIPMENT AND MATERIALS

108-2.1 GENERAL.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be approved under the Airport Lighting Equipment Certification Program described in Advisory Circular (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 Engineer.

c. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not materially comply with these specifications shall be removed, when directed by the Engineer and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

d. All materials and equipment used to construct this item shall be submitted to the Engineer 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 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 boldly and clearly made with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer's opinion, does not meet the system design and the standards and codes, specified herein.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall be responsible to maintain an insulation resistance of 50 megohms minima, (1000V megger) with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period.

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. 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 Federal Specification J-C-30 and shall be type THWN-2.

Cable type, size, number of conductors, strand and service voltage shall be as specified on the plans.

108-2.3 BARE COPPER WIRE (COUNTERPOISE OR GROUND) AND GROUND RODS.

Wire for counterpoise or ground-installations for airfield lighting systems shall be No. 6 AWG solid for counterpoise and or No. 6 AWG stranded for ground wire conforming to ASTM B 3 and ASTM B 8, and shall be **tinned copper** conforming to the requirements of ASTM D 33.

Ground rods shall be **copper or 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 long nor less than 5/8 inch in diameter.

108-2.4 CABLE CONNECTIONS.

In-line connections 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 Minnesota Mining and Manufacturing Company, "Scotchcast" Kit No. 82--B, or as manufactured by Hysol Corporation, "Hyseal Epoxy Splice" Kit No. E1135, or equivalent, is used for potting the splice is acceptable.

b. The Field-attached Plug-in Splice. Figure 3 of AC 150/5345-26, Specification for L-823 Plug and Receptacle, Cable Connectors, employing connector kits, is acceptable-for field attachment to single conductor cable. It shall be the Contractor's responsibility to determine the outside diameter of the cable to be spliced and to furnish appropriately sized connector kits and/or adapters and heat shrink tubing with integral sealant.

c. The Factory-Molded Plug-in Splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The Taped or Heat-Shrunked 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 D 4388 and the plastic tape should comply with Mil Spec. MIL-I-24391 or

Fed. Spec. 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 designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

e. In all the above cases, connections of cable conductors shall be made using crimp connectors utilizing 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 in accordance with the manufacturer's recommendations and listings.

f. All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except the base can ground clamp connector shall be used for attachment to the base can. All exothermic connections shall be made in accordance with the manufacturer's recommendations and listings.

108-2.5 SPLICER QUALIFICATIONS.

Every airfield lighting cable splicer shall be qualified in making cable splices and terminations on cables rated above 5,000 volts AC. The Contractor shall submit to the Engineer proof of the qualifications of each proposed cable splicer for the 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 for cable markers shall conform to Specification Item P-610, "Structural Portland Cement Concrete."

108-2.7 FLOWABLE BACKFILL. (DELETED)

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 – number Scotch 88 (1-1/2" wide) and Scotch 130C linerless rubber splicing tape (2" wide), as manufactured by the Minnesota Mining and Manufacturing Company, or approved equivalent.

108-2.10 ELECTRICAL COATING.

Scotchkote shall be as manufactured by Minnesota Mining and Manufacturing Company, or approved equivalent.

108-2.11 EXISTING CIRCUITS.

Whenever the scope of work requires, connection to an existing circuit, the circuit's insulation resistance shall be tested, in the presence of the Engineer. The test shall be performed in accordance with this item and prior to any activity affecting the respective circuit. The Contractor shall record the results on forms acceptable to the engineer. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the

presence of the Engineer. The Contractor shall record the results on forms acceptable to the engineer. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

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. Wherever possible, cable shall be run without splices, from connection to connection.

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 Engineer 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 or at least once in each access point where L-823 connectors are not installed.

Provide not less than 3 feet 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 vertically above the top of the access structure. This requirement also applies where primary cable passes through empty base cans, junction and access structures to allow for future connections, or as designated by the Engineer.

108-3.2 INSTALLATION IN DUCT BANKS OR CONDUITS.

This item includes the installation of the cable in duct banks or conduit as described below. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be in accordance with the latest 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 interferences are avoided.

Duct banks or conduits shall be installed as a separate item in accordance with 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 insure that the duct bank or conduit is open, continuous and clear of debris. Mandrel size shall be compatible with conduit size.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, etc. interiors IMMEDIATELY prior to pulling cable. Once cleaned and swabbed the base cans 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 Engineer of any blockage in the existing ducts. The cable shall be installed in a manner to prevent harmful stretching of the conductor, injury to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape 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 handwinch or power winch with the use of cable grips or pulling eyes. Maximum pulling-tensions shall be governed by cable manufacturer's recommendations. A non-hardening lubricant recommended for the type of cable being installed shall be used where pulling lubricant is required.

The manufacturer's minimum bend radius or the 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 Engineer, 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 utilize 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(s) shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable(s) 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-inch vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

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, handholes, pullboxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than ¼ inch in size. The cable circuit identification shall match the circuits noted on the construction plans.

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 below finished grade, except as follows:

(1) When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches unless otherwise specified.

(2) Minimum cable depth when crossing under a railroad track, shall be 42 inches unless otherwise specified.

Dewatering necessary for cable installation, erosion and turbidity control, in accordance with Federal, State, and Local requirements is incidental to its respective pay items as part of Item L-108. The cost of all excavation regardless of type of material encountered, shall be included in the unit price bid for the L-108 Item.

The Contractor shall excavate all cable trenches to a width not less than 6 inches. 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 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 sieve. Flowable backfill material may alternatively be used. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All such rock removal shall be performed and paid for under Item P-152.

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 cable(s) cross proposed installations, the Contractor shall insure that these cable(s) 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 Engineer, 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 be 3 inches deep, loose measurement, and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch sieve. This layer shall not be compacted. The second layer shall be 5 inches deep, loose measurement, and shall contain no particles that would be retained on a 1-inch sieve. The remaining 3rd and subsequent layers of backfill shall not exceed 8 inches of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent undisturbed soil, and to the satisfaction of the Engineer. If necessary to obtain the desired compaction, the backfill material shall be moistened or aerated as required.

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 in accordance with 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 Engineer. If not shown on the plans, the warning tape shall be located six inches above the direct-buried cable or the counterpoise wire if present. A 4-6 inch 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 minimum below finished grade.

c. Restoration. 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 and compaction shall meet the requirements of Item P-152. 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 square and 4-6 inches thick, extending approximately 1 inch 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 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 high and 3 inches wide, with width of stroke 1/2 inch and 1/4 inch deep.

The location of each underground cable connection, except at lighting units, or isolation transformers, or power adapters shall be marked by a concrete marker slab placed above the connection. The Contractor shall impress the word "SPLICE" on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed-by the Engineer. All cable markers and splice markers shall be painted international orange. Paint

shall be specifically manufactured for uncured exterior concrete. 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 in accordance with manufacturer's instructions and to the satisfaction of the Engineer.

b. Field-attached Plug-in Splices. These shall be assembled in accordance with manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. In all cases the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.

c. Factory-Molded Plug-in Splices. These shall be made by plugging directly into mating connectors. In all cases, the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.

d. Taped or Heat-Shrunked 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 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 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. Throughout the rest of the splice less tension should be used. 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 1 inch 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.

108-3.6 BARE COUNTERPOISE WIRE INSTALLATION FOR LIGHTNING PROTECTION AND GROUNDING.

If shown on-the plans or included-in the job specifications, bare counterpoise copper wire shall be installed for lightning protection of the underground cables. Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables. Where the cable or duct/conduit trench runs parallel to the edge of pavement, the counterpoise shall be installed in a separate trench located half the distance between the pavement edge and the cable or duct/conduit trench. In trenches not parallel to pavement edges, counterpoise wire shall be installed continuously a minimum of 4 inches above the cable, conduit or duct bank, or as shown on the plans if greater. Additionally, counterpoise wire shall be installed at least 8 inches below the top of subgrade in paved areas or 10 inches below finished grade in un-paved areas. This dimension may be less than 4 inches where conduit is to be embedded in existing pavement. Counterpoise wire shall not be installed in conduit.

The counterpoise wire shall be routed around to each light fixture base, mounting stake, or junction/access structures. The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500feet 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.

If shown on the plans or in the specifications, a separate equipment (safety) ground system shall be provided in addition to the counterpoise wire using one of the following methods:

(1) A ground rod installed at and securely attached to each light fixture base, mounting stake if painted, and to all metal surfaces at junction/access structures.

(2) Install an insulated equipment ground conductor internal to the conduit system and securely attach it to each light fixture base and to all metal surfaces at junction/access structures. This equipment ground conductor shall also be exothermically welded to ground rods installed not more than 500 feet apart around the circuit.

a. 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 cone 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 cone of protection measured 22 ½ 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.

b. 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.

108-3.7 EXOTHERMIC BONDING.

Bonding of counterpoise wire shall be by the exothermic welding process. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the Engineer, 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:

All slag shall be removed from welds.

For welds at light fixture base cans, all galvanized coated surface areas and "melt" areas, both inside and outside of base cans, damaged by exothermic bond process shall be restored by coating with a liquid cold-galvanizing compound conforming to U.S. Navy galvanized repair coating meeting Mil. Spec. MIL-P-21035. Surfaces to be coated shall be prepared and compound applied in accordance with manufacturer's recommendations.

All buried copper and weld material at weld connections shall be thoroughly coated 6 mil of 3M "Scotchkote," or approved equivalent, or coated with coal tar bitumastic material to prevent surface exposure to corrosive soil or moisture.

108-3.8 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 Engineer. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the Engineer. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase and results meeting the specifications below must be maintained by the Contractor throughout the entire project as well as during the ensuing warranty period.

Earth resistance testing methods shall be submitted to the Engineer for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the Engineer. All such testing shall be at the sole expense of the Contractor.

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 Engineer 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 Engineer 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 series circuits or cable segments is not less than 50 megohms.

d. That the insulation resistance to ground of all non-grounded conductors of new multiple circuits or circuit segments is not less than 50 megohms.

e. That all affected circuits (existing and new) are properly connected in accordance with 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 utilized, as described by ANSI/IEEE Standard 81, to verify this requirement.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the Engineer. Where connecting new cable to existing cable, ground resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved "repair" procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1

Trenching for Direct-buried No. 8 AWG L-824C Cable will not be measured for payment. The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be incidental to associated bid items.

108-4.2

Direct-buried L-824 Cable installed in trench shall not be measured for payment.

108-4.3

Cable installed in duct bank or conduit, or counterpoise wire installed in trench, shall be measured by the number of linear feet installed, including grounding connectors and trench marking tape, ready for operation, 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.

BASIS OF PAYMENT

108-5.1

No direct payment shall be made for trenching for Direct Buried Cable or for L-824 Direct Earth Buried Cable. The costs for furnishing all materials and for all preparation, delivery and installation of these materials and all labor, equipment, tools and incidentals shall be incidental to and included in other contract unit prices.

108-5.2

Payment will be made at the contract unit price for 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 Engineer. 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.

- Item L-108a Trenching for Direct-buried Cable – incidental
- Item L-108b No. 8 AWG L-824C Cable, Installed in Trench - incidental
- Item L-108c No. 8 AWG L-824C Cable, Installed in Duct Bank or Conduit - per linear foot
- Item L-108d Bare Counterpoise Wire, Installed in Trench, Including Ground Rods and Ground Connectors – per linear foot

MATERIAL REQUIREMENTS

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
FED SPEC J-C-30	Cable and Wire, Electrical Power, Fixed Installation (cancelled; replaced by A-A-59544 Cable and Wire, Electrical (Power, Fixed Installation))
FED SPEC A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic
ASTM B 3	Soft or Annealed Copper Wire
ASTM D 4388	Rubber tapes, Nonmetallic Semiconducting and Electrically Insulating

REFERENCE DOCUMENTS

NFPA No. 70	National Electrical Code (NEC)
MIL-S-23586C	Sealing Compound, Electrical, Silicone Rubber Building Industry Consulting Service International (BICSI)
ANSI/IEEE Std 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

END OF ITEM L-108

ITEM L-110
AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

DESCRIPTION

110-1.1

This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete) installed in accordance with this specification at the locations and in accordance with the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandreling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables in accordance with 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 so requested by the Engineer.

b. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not materially comply with these specifications shall be removed, when directed by the Engineer and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used to construct this item shall be submitted to the Engineer 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 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 boldly and clearly made with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer'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.

110-2.2 STEEL CONDUIT.

Rigid galvanized steel conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standard 6, 514B, and 1242.

110-2.3 PLASTIC CONDUIT.

Plastic conduit and fittings shall conform to the requirements of Fed. Spec. W--C-1094, Underwriters Laboratories Standards UL-651 and Article 347 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I--Schedule 40 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.

The type of adhesive 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 conform to Item P-610, Structural Portland Cement Concrete, using 1 inch maximum size coarse aggregate with a minimum 28 day compressive strength of 3,000 psi. Where reinforced duct banks are specified, reinforcing steel shall conform to ASTM A 615 Grade 60. Concrete and reinforcing steel are incidental to the respective pay item of which they are a component part.

110-2.7 FLOWABLE BACKFILL. (DELETED)

110-2.8 DETECTABLE WARNING TAPE.

Plastic, detectable, color as noted magnetic tape shall be polyethylene film with a metallized foil core and shall be 4-6 inches 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 Engineer 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 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 per 100 feet. 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. No duct bank or underground conduit shall be less than 18 inches below finished grade. Where under pavement, the top of the duct bank shall not be less than 18 inches below the subgrade.

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 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 base cans, manhole, 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 Engineer 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 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 contaminate 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.

Unless otherwise shown on the plans, concrete encased duct banks shall be utilized when crossing under pavements expected to carry aircraft loads.

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 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 sieve.

Flowable backfill may alternatively be used. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All such rock removal shall be performed and paid for under Item P-152.

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 Engineer. If not shown on the plans, the warning tape shall be located six inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared in accordance with 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.

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 Engineer, the unsuitable material shall be removed in accordance with Item P-152 and replaced with suitable material. Alternatively, additional duct bank supports that are adequate and stable shall be installed, as approved by the Engineer.

All excavation shall be unclassified and shall be considered incidental to the respective L-110 pay item of which it is a component part. Dewatering necessary for duct installation, erosion and turbidity control, in accordance with Federal, State, and Local requirements is incidental to its respective pay item as a part of Item L-110. The cost of all excavation regardless of type of material encountered, shall be included in the unit price bid for the L-110 Item.

Unless otherwise specified, excavated materials that are deemed by the Engineer to be unsuitable for use in backfill or embankments shall be removed and disposed of off-site.

Any excess excavation shall be filled with suitable material approved by the Engineer and compacted in accordance with 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 insure that these cable(s) 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 Engineer, 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 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 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 beyond the edges of the pavement or 3 feet beyond any underdrains 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, proper 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 thick prior to its initial set. Where two or more conduits in the duct bank are intended to carry conductors of equivalent voltage insulation rating, the Contractor shall space the conduits not less than 1-1/2 inches apart (measured from outside wall to outside wall). Where two or more conduits in the duct bank are intended to carry conductors of differing voltage insulation rating, the Contractor shall space the conduits not less than 3 inches 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 thick unless otherwise shown on the plans. End bells or couplings shall be installed flush with the concrete encasement at access points.

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 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 intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the Engineer 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 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, 4-6 inch wide tape 8 inches minimum below grade above all underground conduit or duct lines not installed under pavement.

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 Engineer 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 Engineer.

110-3.3 CONDUITS WITHOUT CONCRETE ENCASEMENT.

Trenches for single-conduit lines shall be not less than 6 inches nor more than 12 inches wide, and 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 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 sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits are at least 18 inches below the finished grade.

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 2 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction. 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 spaced not less than 3 inches apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches 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 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 intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the Engineer 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 square and 4-6 inches thick extending approximately 1 inch 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.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. 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 Engineer. The letters shall be 4 inches high and 3 inches wide with width of stroke 1/2-inch and 1/4-inch deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 BACKFILLING FOR CONDUITS.

For conduits, 8 inches of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The

remaining trench shall then be backfilled and compacted in accordance with Item P-152 "Excavation and Embankment" except that material used for back fill shall be select material not larger than 4 inches in diameter.

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 in accordance with instructions issued by the Engineer.

110-3.6 BACKFILLING FOR DUCT BANKS.

After the concrete has cured, the remaining trench shall be backfilled and compacted in accordance with Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches in diameter. In addition to the requirements of P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet of duct bank or one work period's construction, whichever is less.

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 in accordance with instructions issued by the Engineer.

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.

METHOD OF MEASUREMENT

110-4.1

Underground conduits and duct banks shall be measured by the linear feet of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and 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 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. The price shall fully compensate for all incidentals and electrical labor to fully restore existing airport electrical circuits as required by the plans.

Payment will be made under:

- | | |
|-------------|---|
| Item L-110a | Concrete Encased Electrical Duct Bank (2 way, 4 Inch) - per linear foot |
| Item L-110b | Electrical Conduit (DEB) (2 Inch) – per linear foot |

MATERIAL REQUIREMENTS

Fed.Spec.W-C-1094	Conduit and Conduit Fittings; Plastic, Rigid (cancelled; replaced by UL 514 Boxes, Nonmetallic Outlet, Flush Device Boxes, & Covers, and UL 651 Standard for Conduit & Rigid Conduit, Type EB & A Rigid PVC)
Underwriters Laboratories Standard 6	Rigid Metal Conduit
Underwriters Laboratories Standard 514B	Fittings for Cable and Conduit
Underwriters Laboratories Standard 1242	Intermediate Metal Conduit
Underwriters Laboratories Standard 651	Schedule 40 and 80 Rigid PVC Conduit (for Direct Burial)
Underwriters Laboratories Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit (for concrete encasement)

END OF ITEM L-110

ITEM L - 125
AIRPORT LIGHTING SYSTEMS, GUIDANCE SIGNS AND EDGE MARKERS

DESCRIPTION

125-1.1

This item shall consist of airport lighting systems, guidance signs, retroreflective pavement edge markers, and splices bases furnished and installed in accordance with this Specification, the referenced Specifications, and the applicable Advisory Circulars. The systems are to be installed at the location 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 Engineer.

MATERIALS

125-2.1 REFERENCES.

- A. Airport lighting equipment and materials covered by FAA Specifications shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, D.C. 20591, and shall be listed in Advisory Circular 150/5345-53C (current edition), Approved Airport Lighting Equipment.
- B. Airport guidance signs and materials covered by FAA specifications shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, D.C. 20591, and shall be in accordance with Advisory Circular 150/5345-44H, Specification for Taxiway and Runway Signs.
- C. All other equipment and materials covered by other referenced Specifications shall be subject to acceptance through the manufacturer's certification of compliance with the applicable Specifications.
- D. Lists of the equipment and materials required for a particular system are contained in the applicable Advisory Circular.

125-2.2 TAPE.

Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88, respectively, as manufactured by the Minnesota Mining and Manufacturing Company, or an approved equal.

125-2.3 CONCRETE.

Concrete shall conform to Specification Item P-610, Structural Portland Cement Concrete.

125-2.4 LIGHTING CABLE.

See Item L-108 for requirements.

125-2.5 SPLICES.

See Item L-108 for requirements.

125-2.6 BASE-MOUNTED EDGE LIGHTS.

Base-mounted edge lights shall meet the requirements of Advisory Circular 150/5345-46D and shall include furnishing and installing L-823 connector kits, L-830 transformers (30/45/100 watt, 6.6/6.6 AMP), L-861 light units, L-867 bases and installation of the light units in the locations shown on the Plans. The runway threshold lights (L-861 SE) require a 100 watt L-830 transformer. Inner lenses are to be 180 degrees red and 180 degrees green. The runway edge lights (L-861) require a 45 watt transformer. Lenses are to be 360 degrees clear. The taxiway edge lights (L-861T) require a 30 watt transformer. Lenses are to be 360 degrees blue. All L-867, Size B, light bases shall have a 1/2 inch minimum diameter drain hole drilled in the bottom and shall be furnished with factory attached grounding lug on the exterior wall of the base prior to galvanizing. Connect a #6 AWG bare jumper to the ground lug and connect it to a ground rod at each fixture.

125-2.7 GROUND RODS WITH GROUND ROD CONNECTION.

Grounding electrodes shall be solid copper or copper clad steel rods at least 5/8 inch in diameter by 8 feet long. Grounding clamps shall be high strength, high conductivity, and cast bronze with a screw for wrench driving. Extruded, drawn, or stamped type ground clamps are not acceptable. Ground Rod connection shall be #6 AWG, bare solid copper. Ground rods and connections are incidental to the pay item.

125-2.8 SPLICE BASE.

This item consists of providing an L-867 Light Base w/Solid Lid and L-823 Connector Kits per the Plans. All L-867, Size D splice bases shall have a 1/2 inch minimum diameter drain hole drilled in the bottom and shall be furnished with factory attached grounding lugs on both the interior and exterior wall of the base prior to galvanizing. Splice bases provided in long cable runs to facilitate pulling cables shall have smooth interior edges at the ends of conduits or shall have bell ends on conduits to prevent scraping damage to cable insulation while pulling.

125-2.9 LIGHTED GUIDANCE SIGNS.

Internally lighted guidance signs shall be in accordance with FAA Advisory Circular 150/5345-44H. The signs shall be Type L-858Y, R, L, or B, as detailed on the Plans. The size and style shall be as detailed on the Plans. Signs shall be Class 1. Signs shall include all foundation, support, and electrical components as detailed on the Plans and required by AC 150/5345-44H. Where designated to add a sign module adjacent to an existing sign, the new module shall match the brand of the existing sign.

If shown on the plans, the table for estimated volt-ampere loads has been used in the circuit design. The sign load volt-amperes (VA) shall not exceed the values shown by more than 15 percent even if the regulator has excess capacity. The total volt-ampere circuit load of signs, lights, and other circuit components shall not exceed the capacity and capability of any constant current regulator. If the Contractor supplies equipment which exceeds the VA or KW capacity of the regulator, the regulator shall be replaced at no cost to the Owner.

125-2.10 LIGHTED SIGN ISOLATION TRANSFORMERS.

Isolation transformers shall be Type L-830 and be of the proper wattage for each sign's power loading through a series circuit powered by a 3 step L-858 constant current regulator.

125-2.11 TRUE RMS METER.

A true RMS reading multi-meter shall be provided for sign lamp current adjustment with a protective carrying case, complete instructions and field probe/clamp leads. This unit will become airport property at Project completion and is incidental to the sign unit cost.

125-2.12 UNLIGHTED GUIDANCE SIGNS.

Unlighted guidance signs shall be in accordance with FAA Advisory Circular 150/5345-44H. The signs shall be Type L-858Y, R, or L (Style 4) as detailed on the Plans. The size shall be as detailed on the Plans. Signs shall be Mode 1. Signs shall include all foundation and support components as detailed on the Plans and required by AC 150/5345-44H.

125-2.13 MATERIALS CONDITION.

All material shall be in new and unused condition, with the exception of designated relocated and/or salvaged materials. Relocated and/or salvaged materials that are damaged by the Contractor shall be replaced with new materials at no additional cost to the Owner.

125-2.14 INSTRUCTION GUIDE.

Three instruction guides with sign installation details, maintenance requirements and current adjustment procedures shall be included with each order of signs.

125-2.15 RETROREFLECTIVE MARKERS.

Retroreflective markers shall be Type L-853 and shall be in accordance with Advisory Circular 150/5345-39C, Type II, blue.

CONSTRUCTION METHODS

125-3.1 SCOPE.

Site Work shall include all grading, ground surface preparation, excavation, trenching, and disposal required to completely prepare the job site for installation of structures and cables, and to provide the required surface drainage. All Site Work shall be considered as an incidental cost included in the Unit Price Bid.

125-3.2 LAYOUT OF WORK.

Work under this Contract will require the Contractor to set his own stakes, marks and reference points for establishment of lines and grades which will be taken from the control grades and lines shown on the Drawings.

125-3.3 PROTECTION OF EXISTING AIRPORT LIGHTING SYSTEM COMPONENTS.

The Contractor shall be responsible to locate and protect existing system components in the vicinity of the Work. The locations shown on the Project Drawings are general and for information only and do not represent the exact locations of such system components. The Contractor shall be responsible for repair or replacement of any system components damaged by his operations at no additional cost to the Owner.

125-3.4 GENERAL.

The installation, relocation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow the work schedules established at the Pre-construction Conference. The systems shall be installed in accordance with the National Electrical Code and/or local code requirements. Only complete and properly operational lighting and signage installations or relocations will be accepted.

Note: All lights and signage assemblies shall have frangible (breakable) couplings properly installed.

Caution: The series lighting circuit must always be complete before a regulator is energized. Normal circuit voltage is less than 5,000 volts; open circuit voltage can be more than

10,000 volts. All personnel shall be instructed to protect the integrity of the lighting circuit. The regulator shall be turned off at the vault before opening the circuit. Continuity of the circuit shall be checked before the regulator is reconnected and re-energized.

125-3.5 EXISTING CIRCUIT CABLE TERMINATIONS.

The Contractor shall positively identify and tag all existing circuit cables exposed and unplugged at light/sign base locations intended for reconnection and circuit continuation and shall be carefully protected, waterproofed and located for reuse.

125-3.6 LIGHT FIXTURES.

The light fixtures consist of an optical system, lamp, connecting leads, and a mounting assembly. The installer shall assemble, connect to mounting, level and adjust the light fixture in accordance with the manufacturer's instructions. The light fixtures shall be leveled and aligned. The location and elevation of the light fixtures shall be as specified on the Plan details. Edge lights shall be in a straight line parallel to the pavement centerline. They shall be located as specified on the Plans within a tolerance of $\pm 1/2$ inch. The splice bases shall also be set plumb within a tolerance of ± 1 degree.

The light fixture must be bonded to the light base internal ground lug via a #6 AWG stranded copper wire rated for 600 volts with green XHHW insulation. The ground wire length must be sufficient to allow the removal of the light fixture from the light base for routine maintenance. See the light fixture manufacturer's instructions for proper methods of attaching a bonding wire.

The lights are to be installed in the paved or unpaved shoulders, and set to provide a uniform light line. Any soil required to be imported or removed shall be considered as incidental to the light installation. The soil shall be graded to drain away from the lights. The soils disturbed around the lights shall be compacted to a density at least equal to the natural undisturbed soil density.

125-3.7 BASE-MOUNTED LIGHT/SPLICE BASE.

If the soil is unsuitable, then an adequate depth of soil shall be removed and replaced with compacted acceptable material. The drainage rock shall be placed on the prepared subgrade and the base shall be placed, elevated and leveled and be concrete encased as shown on the Plans by pre-casting or field pour.

The Contractor is responsible for the careful and complete salvage of any designated light units. These specified light units with new isolation transformers, shall be relocated on new L-867 bases, set on grade at the locations indicated on the Plans, and the edge lights re-lamped with new lamps.

The Contractor shall level the light base so the frangible coupling is at the elevation required, below the edge of the pavement adjacent to the edge light. With the base properly oriented, duct properly installed, and held at the proper elevation as determined by the Plans; backfill around the outside of the light. The earth shall be compacted at least to the density of undisturbed soil. The finished installation shall be free from depressions that would hold water or bumps, or exposed edges which would damage aircraft tires if one should accidentally hit them.

Prior to mounting the light fixture on the base, L-823 connector kits shall be installed on the primary power cable ends and the appropriate new L-830 isolation transformer is installed. These transformers serve as a means of isolating the unit from the high voltage primary of the series circuit. Wrap the connector joints in the primary circuit with at least 1 layer of rubber or synthetic rubber tape and 1 layer of plastic tape 1/2 lapped extending at least 1-1/2 inches on each side of the joints, as per Item L-108.

After the connector has been installed and taped, the cable insulation shall be cleaned with a wax and grease solvent which will remove the silicone sealing grease from the surface of the cable. A sealant equal to Raychem S-1052 (strips) shall be wrapped around the installation of the cables. Heat shrinkable tubing equal to Raychem MWTM-3612 shall then be slid over the ends of the connector. Heat shall be applied at the center of the connector and spread to the ends to shrink the tubing and melt the sealant to provide a waterproof seal. Excessive heat shall be avoided.

Plug the light disconnecting plug into the transformer secondary receptacle, and secure the transformer plug in the base lid cable clamp. Install the brick under the transformer and away from the base weephole. Then install the baseplate gasket and secure with the provided bolts.

125-3.8 INTERNALLY LIGHTED GUIDANCE SIGN INSTALLATION.

Each sign shall consist of the panel(s), mounting hardware, light source, wiring, secondary extensions, transformer, light base (L-867), and the concrete base. The concrete base shall be as shown on the Plans. The base shall be reinforced with 6 inch by 6 inch #10 x #10 wire mesh and all edges shall be chamfered.

Any soil required around the sign base shall be compacted and the slope shall not exceed 5 to 1.

The guidance signs shall be powered by the runway and taxiways series circuits.

Signs shall be sealed to prevent blowing rain, snow and dust from entering the sign under the conditions at the Airport where they will be installed.

When replacement sign face panels are required to be furnished and installed in existing signs, the original sign manufacturer shall certify that the retrofit units meet or exceed the original Specifications.

Frangible couplings shall break along the designed line without sharp edges or protruding points. Floor flanges shall not break and anchor bolts shall not pull out before failure of the frangible coupling. The top of the signs shall not wobble or move more than 1 percent of the overall height when pushed by hand.

Signs shall have sections or panels that are removable for relamping and to allow for cleaning the complete interior of the sign. The removable portion shall totally separate from the remainder of the sign.

The sign manufacturer shall provide a 5 year warranty for all electronic components, circuit boards and electrical devices in the sign, excluding lamps. This warranty shall include the replacement parts and delivery of them to the Airport at no cost to the Owner.

All sign lamps shall be of the same type. Approved lamps shall be manufactured by at least 2 sources and shall be readily available from commercial electrical supply dealers.

Paint on the sign shall not peel.

Wiring shall be secured and protected from rubbing and chaffing.

If lamp current or voltage adjustments are to be made, access shall be provided so the Work can be done by 1 person without kneeling or lying down. Screw type adjustments shall include guides and barriers to prevent contact with any live components.

The Contractor shall submit test reports, certified by the manufacturer, stating the electrical characteristics of each sign. The reports shall provide total volt-amperes, watts, power factor, lamp current and voltage for each brightness step (style 2, 4.8, 5.5 and 6.6 amperes).

125-3.9 UNLIGHTED GUIDANCE SIGN INSTALLATION.

The unlighted signs are to be installed in the paved or unpaved shoulders, set plumb and level to provide a clear sight line. Any soil required to be imported or removed shall be considered as incidental to the sign installation. The soil shall be graded to drain away from the signs. The soil disturbed around the sign shall be compacted to a density at least equal to the natural undisturbed soil density. If the soil is unsuitable, then an adequate depth of soil shall be removed and replaced with compacted acceptable material. The sign base legs shall have frangible couplings and concrete anchors placed as shown on the Plans.

The Contractor shall level the mounting legs or stakes so that the frangible couplings are at the elevation required below the edge of the pavement adjacent to the sign. With the sign properly oriented and at the proper elevation, earth backfill around the legs or stakes and anchor concrete shall be compacted at least to the density of undisturbed soil. The finished installation shall be free from depressions that would hold water or bumps, or exposed edges that would damage aircraft tires if one should accidentally hit them.

125-3.10 GROUNDING.

Ground rods shall be attached to the ground wire by grounding clamps. Brazing, welding, or equivalent method such as CADWELD exothermic process or BURNDY THERMOWELD or equivalent for attaching ground wire to ground rods may also be used. Soldered connections shall not be used. Ground wires shall be so connected to provide an electrically continuous grounding for the respective structural unit or assembly. If called for in the Plans a safety ground circuit may also be installed and connected to the ground bus at the airfield lighting vault. The safety ground circuit may be a #6 AWG insulated wire for 600 volts (XHHW). Insulation shall be colored green. Attach the safety ground circuit to the ground lug at each light base or mounting stake, and secure the entire lighting circuit to the ground bus at the vault. The safety ground circuit must be installed in the same duct or conduit as the lighting power conductors. Safety grounds and connections are incidental.

125-3.11 RETROREFLECTIVE MARKERS.

Retroreflective markers shall be installed plumb and to 24 inches high at the locations shown on the Plans.

125-3.12 DISPOSAL.

Any excess material from graded areas shall be spread evenly in the areas immediately adjacent to the site in such manner as to maintain proper drainage of the area. All removed concrete bases, trash, deleterious material and other objectionable matter resulting from the construction shall be disposed of properly off the airport.

125-3.13 RESTORATION.

All areas disturbed by the trenching, storing of dirt, cable laying, pad construction and other shall be restored to its original condition.

QUALITY ASSURANCE CERTIFICATIONS

125-4.1 GENERAL.

In order to be eligible for installation under the airport grant program, manufacturers of the type of equipment specified herein are required to certify or furnish proof to the Airport Owner, or the Owner's Representative, that the equipment conforms to the following provisions.

125-4.2 GUARANTEE.

The manufacturer shall provide the following guarantee: The equipment has been manufactured in accordance with Specifications and any defect in material or workmanship which may occur within 5 years from installation will be corrected or replaced by the manufacturer at no cost to the Owner.

125-4.3 VISUAL INSPECTION.

The signs shall be examined for compliance with the requirements for legend, dimensions, materials, finish, and quality of workmanship. The signs shall be viewed in daylight from a distance of 800 ft. The sign type, as defined in Advisory Circular 150/5345-44H, should be readily identifiable. The sign face and reflective material shall appear to be smooth and shall be free of any aberration (excepting minor seams between retroreflective sheets) and sharp edges.

125-4.4 PRODUCTION TESTING.

All production sign legend panels shall be inspected for compliance with all dimensions described herein. Reflective material shall appear to be smooth and be free of any aberration (except at seams). Panel joints of modular signs shall be observed to ensure that they not interfere with the legibility of the sign.

125-4.5 ELECTRICAL CONTINUITY.

After installation, all cables shall be tested to demonstrate electrical continuity, freedom from short circuits, and a minimum of 50 megohms resistance between conductors and from each conductor to ground when tested at not less than 500 volts D.C.; unless the cable is rated at a lower voltage.

125-4.6 OPERATION TEST.

A complete check shall be made of all regulators, wiring, lighting, and lighted signage in the system circuits to assure that all connections are tight, correct, and in full accord with the installation requirements.

With power connections completed, the Contractor shall then demonstrate by operational tests each entire system will operate satisfactorily as specified. With all portions of the system functioning properly, a test run of not less than 4 15-minute cycles shall be made to demonstrate the compliance with Specifications and acceptability of the installation.

The Contractor shall demonstrate to the Engineer, FAA, State Aeronautics representatives, and/or Owner that the equipment is properly adjusted mechanically and electrically, and perform the insulation tests at the time of the acceptance inspection.

125-4.7 SIGN CURRENT ADJUSTMENT.

With all circuits energized and operating properly after testing procedures have been demonstrated to the satisfaction of the Engineer, proceed to adjust each sign current draw at all 3 intensity settings following the manufacturer's operation instructions using the True RMS Meter.

Signs unable to maintain current adjustments will be "punch listed," and it will be the Contractor's responsibility to coordinate parts replacement expeditiously and perform current adjustments in the presence of the Engineer.

METHOD OF MEASUREMENT

125-5.1

The quantity of lights, signs, splice bases, safety grounds or retroreflective edge markers to be paid for under this item shall be the number of each type installed as completed units in place, ready for operation, and accepted by the Engineer. Double-faced signs shall be counted as 1 sign for payment.

BASIS OF PAYMENT

125-6.1

Payment will be made at the Contract Unit Price for each complete light, sign, splice base, safety ground or retroreflective edge marker installed by the Contractor and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item, including concrete foundations, mounting legs or stakes, transformers, splice bases for lighted signs, L-867 bases for lights, grounds, connector kits, and all above-ground wiring.

Payment will be made under:

- Item L-125a Splice Base - per each
- Item L-125b Retroreflective Edge Marker - per each

FEDERAL SPECIFICATIONS REFERENCED IN ITEM L-125

Number	Title
WW-C-581	Conduit, Metal, Rigid; and Coupling; Elbow; and Nipple, Electrical Conduit: Zinc-Coated
W-C-1094	Conduit and Fittings: Non-Metallic Rigid (Plastic)
WW-C-581	Conduit, Metal, Rigid; and Coupling; Elbow; and Nipple, Electrical Conduit: Zinc-Coated
J-C-30	Cable and Wire, Electrical Power, Fixed Installation
HH-I-595	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic, for Low-Temperature Application

- AC 150/5340-30D Design and Installation Details for Airport Visual Aids
- AC 150/5345-39C Specification for L-853 Runway and Taxiway Retroreflective Markers
- AC 150/5345-42F Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
- AC 150/5345-44H Specification for Taxiway and Runway Signs
- AC 150/5345-46D Specification for Runway and Taxiway Light Fixtures
- AC 150/5345-47B Isolation Transformers for Airport Lighting Systems
- AC 150/5345-53C Approved Airport Lighting Equipment

END OF ITEM L – 125

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IV CONDITIONS OF CONTRACT

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SECTION 1

Definitions and Terms

These Conditions of Contract shall replace in its entirety the General Conditions of the New Mexico Standard Specifications for Public Works Construction, latest edition.

Wherever used in these Conditions of Contract or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Abbreviations - Wherever the following abbreviations or symbols are used, they are to be construed the same as the respective expressions represented:

AASHTO	American Association of State Highway and Transportation Officials
ABC	Aggregate Base Course
AC	Asphalt Concrete
ACB	Asphalt Concrete Base
ACI	American Concrete Institute
ACNM	Associated Contractors of New Mexico
ACP	Asbestos Cement Pipe
ACPA	American Concrete Pipe Association
AD	Assessment District
AGC	Associated General Contractors of America, Inc.
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
Asph	Asphalt
ASTM	American Society for Testing and Materials
AWG	American Wire Gage (Nonferrous Wire)
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BC	Beginning of Curve or Back of Curb
BCR	Beginning of Curb Return or Back of Curb Radius
BM	Bench Mark
BWG	Birmingham Wire Gage (Iron and Steel Wire)
CB	Catch Basin
C.C. or C/C	Center to Center
Cem	Cement
CF	Curb Face
CI	Cast Iron
CIP	Cast-iron Pipe
CIPP	Cast-in-Place Pipe
C.L. or CL	Center Line
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CO	Clean Out
Col	Column
Conc	Concrete
Const	Construct
DF	Douglas Fir
DG	Decomposed Granite
DMH	Drop Manhole
D/W	Driveway
EC	End of Curve
EL.or Elev	Elevation
Ex.or Exist	Existing
F & C	Frame and Cover
FH	Fire Hydrant
FL	Flow Line
F1.E1	Floor Elevation
FS	Federal Specification of Finished Surface
FHWA	Federal Highway Administration, Department of Transportation
Galv	Galvanized
GL	Ground Line
Gr	Grade
H	Height or High
HC	House Connection Sewer
Hor	Horizontal
ID	Inside Diameter
CC-1	

Inv	Invert
IP	Iron Pipe
ITE	Institute of Transportation Engineers
Lin	Linear
LL	Liquid Limit
Long	Longitudinal
Max	Maximum
MH	Manhole
M	Thousand
m	Meter or Middle
Min	Minutes or Minimum
Mon	Monolithic or Monument
MTD	Multiple Tile Duct
MUTCD	Manual on Uniform Traffic Control Devices, latest edition
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NGS	National Geodetic Survey
NMSA	New Mexico Statutes Annotated, 1978 Compilation
NMSHTD	New Mexico State Highway and Transportation Department
OC	On Center
OD	Outside Diameter
PC	Point of Curvature
PCC	Point of Compound Curve or Portland Cement Concrete
PI	Point of Intersection or Plasticity Index
PL	Property Line or Plastic Limit
PP	Power Pole
ppm	Parts per Million
PRC	Point of Reverse Curve
Prop	Proposed or Property
psf	Pounds per Square Foot
psi	Pounds per Square Inch
PT	Point of Tangency
Pvmt	Pavement
PVCP	Polyvinylchloride Pipe
Q	Rate of Flow
R	Radius
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
Rdwy	Roadway
Ret.Wall	Retaining Wall
RGRCP	Rubber Gasket-Reinforced Concrete Pipe
R/W	Right-of-Way
s	Slope
SAE	Society of Automotive Engineers
San	Sanitary
SCCP	Steel Cylinder Concrete Pipe
SD	Storm Drain
Sdl	Saddle
Sect	Section
Spec	Specifications
Sp.MH	Special Manhole
San.S	Sanitary Sewer
St	Street
Sta	Station
Std	Standard
T	Tangent Distance
TH	Test Hole
TMH	Trap Manhole
UL	Underwriters' Laboratories, Inc.
USA	United States of America Standards Institute, Inc.
V	Velocity
VC	Vertical Curve
VCP	Vitrified Clay Pipe
VCPI	Vertical Curve Point of Intersection
Vert	Vertical
W.I	Wrought Iron

All abbreviations and symbols used on plans for structural steel construction shall conform to those given in the Steel Construction Manual of the American Institute of Steel Construction.

Definitions - Wherever used in these Conditions of Contract or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Agreement - The executed written agreement which constitutes a contract between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement. (Form AF-10)

Application for Payment - The CONTRACTOR shall use industry standard forms, acceptable to OWNER, when requesting progress payments and include the schedule of values required by paragraph 14.1 as well as an affidavit of CONTRACTOR that progress payments received on account of the Work have been applied by CONTRACTOR to discharge in full all CONTRACTOR's obligations reflected in prior Applications for Payment.

Bid - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bid Bond - (See Proposal Guarantee)

Bid Proposal - (See Proposal)

Bidder - Any person, firm, or corporation submitting a Bid for the Work.

Board - The Governing Body of the OWNER or Contracting Agency.

Bonds - Bid, performance, and labor, material and tax payment bonds and other instruments of security, furnished by CONTRACTOR and his Surety in accordance with the Contract Documents. (Forms AF-6, AF-11, and AF-12)

Building Code - Reference to Building Codes or City ordinances shall mean the Uniform Building Code or the Farmington City Code, as most recently adopted, revised or modified, including the sidewalk and driveway ordinance. As outlined in the abbreviations the UBC, UMC, UPC, NEC and UFC are the minimum standards that any building or structure will be built to.

Calendar Day - A calendar day of twenty-four (24) hours measured from midnight to the next midnight.

Change Order - A written order to CONTRACTOR signed by OWNER authorizing an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time issued after execution of the Agreement. (Form AF-15)

City - The city of Farmington, New Mexico; same as OWNER.

City of Farmington Technical Specifications and Construction Standards - latest revision, available for a nominal fee through the City Public Works Department, 2nd Floor, 805 Municipal Drive, Farmington, NM 87401.

Conditions of Contract - Conditions which apply to all projects and which can be modified by Special Conditions.

Contract - (Same as Agreement) - The entire agreement between CONTRACTOR and OWNER, including the Advertisement for Bids, Instructions to Bidders, Bid Proposal, Proposal Guarantee, Agreement, Performance Bond, Labor, Material and Tax Payment Bond, Notice of Award, Notice to Proceed, Conditions of Contract, Special Conditions, Drawings, Specifications and all Addenda, as prepared by the City of Farmington, all of which are made a part of the Agreement.

Contract Documents - Including but not limited to the following documents which form the Contract:

- A. Invitation to Bid (Form AF-1(a))
- B. Contractor's Checklist (Form AF-1(b))
- C. Advertisement for Bids (Form AF-2)
- D. Bid Proposal (Form AF-3)
- E. Bidder's Estimate of Taxes (Form AF-4)
- F. Contractor's List of Subcontractors (Form AF-5)
- G. Bid Bond (Form AF-6)
- H. Statement of Bidder's Qualifications (Form AF-8)

- I. Notice of Award (Form AF-9)
- J. Agreement (Form AF-10)
- K. Performance Bond (Form AF-11)
- L. Labor, Material and Tax Payment Bond (Form AF-12)
- M. Certificate of Insurance (Acord Form 25)
- N. Notice to Proceed (Form AF-14)
- O. Change Order (Form AF-15)
- P. Certificate of Substantial Completion (Form AF-16)
- Q. Release and Waiver of Liens (Form AF-18)
- R. Subcontractor's Release and Waiver of Liens (Form AF-19)
- S. Contractor's Statement Concerning Claims (Form AF-20)
- T. Waiver for Partial Payments (Form AF-21)
- U. Drug Free Workplace Certification (Form AF-25)
- V. Contractor Safety Certification (Form AF-26)
- W. Minimum Wage Rates
- X. Special Conditions
- Y. Technical Specifications
 - a. Drawing(s)
 - b. Addenda
 - c. Purchase Order

Contract Price - The total monies payable to CONTRACTOR under the Contract Documents, or the price established for each of the payment items listed in the Bid Proposal (Form AF-3), as the context indicates.

Contract Time - The number of days stated in the Invitation to Bid (Form AF-1(a)) for the completion of the Work, computed as provided in paragraph 17.2.

Contracting Agency - (See OWNER)

Contractor - The person, firm, or corporation with whom OWNER has executed the Agreement.

Day - (See Calendar Day)

Designated Representative - Authorized representative designated by the Engineer to authorize or approve Work (i.e. OWNER's employee or outside consultant).

Drawings or Plans - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by the OWNER and are referred to in the Contract Documents.

Dispute - Lack of agreement between any parties that have any obligations, duties or responsibilities under the terms of the Contract.

Engineer - The OWNER's employee responsible for the engineering design and construction inspection and supervision, acting directly or through duly authorized representatives.

Extra Work - Such additional labor, materials, equipment, and other incidentals, as are required to complete the Contract for the purpose for which it was intended but was not shown on the Drawings or called for in the Specifications or is authorized by the OWNER in addition to that Work called for in the Drawings and Specifications.

Field Order - A written order issued by OWNER which clarifies or interprets the Contract Documents or orders minor changes in the Work in accordance with paragraph 10.2.

Force Majeure - An act of God, earthquake, flood, cyclone or other cataclysmic phenomenon of nature. A rain, windstorm, high water or other natural phenomenon of unusual intensity for the locality where the Work is to be performed, but which might reasonably have been anticipated from historical records of the general locality shall not be construed as an act of God. Additionally, the act of the public enemy, fire, explosion, perils of the sea, war, riot, sabotage, acts of governmental authorities, embargo, or any other circumstances of like or different character beyond the reasonable control of the CONTRACTOR, or by interruption or delay in transportation, labor

trouble of a supplier from whatever cause arising and whether or not the demands of the employees involved are reasonable and within the affected party's power to concede or compliance with any order or request of any governmental officer, department, agency or committee shall further be considered as a force majeure. Provided; however, that any failure which CONTRACTOR intends to rely upon as an excuse for failure to perform or failure to perform in a timely manner, shall only be considered by OWNER if CONTRACTOR has given OWNER written notice of intention to rely upon such act within ten (10) days after the occurrence giving rise to the delay. Upon the occasion of such event, the parties shall meet and confer and any additional time necessary shall be fixed by the OWNER, which determination shall be final.

General Conditions - A term having the same meaning as the term Conditions of Contract.

General Provisions - A term having the same meaning as the term Conditions of Contract.

Holiday or Legal Holiday - Any Calendar Day observed or authorized by the Contracting Agency as a non-working holiday.

Inspector - The Engineer's authorized representative assigned to make detailed inspections of Contract performance.

Laboratory - An independent materials testing laboratory operated as a commercial testing laboratory under the direct supervision of a licensed professional engineer in the State of New Mexico.

Liens - The term liens shall include material liens, mechanic liens, liens of taxing authority, security interests, encumbrances, and all claims including those made pursuant to the "Little Miller Act" (Section NMSA 13-4-18 through 13-4-20).

Modification - (a) A written amendment to the Contract Documents signed by both parties, (b) a Change Order, (c) a written clarification or interpretation issued by Engineer, or (d) a written order for a minor change or alteration in the Work issued by Engineer pursuant to paragraph 10.2. A modification may only be issued after execution of the Agreement.

New Mexico State Department of Transportation Standard Specifications for Highway and Bridge Construction. Reference to NMSHTD, Standard Specifications shall be construed to mean New Mexico Standard Specifications for Highway and Bridge Construction, latest edition thereof.

Notice of Award - The written notice by OWNER to the apparent successful Bidder stating that, upon compliance with the conditions precedent to be fulfilled by him within the time specified, OWNER will execute and deliver the Agreement to him. (Form AF-9)

Notice to Proceed - A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform his obligations under the Contract Documents. (Form AF-14)

Owner - For the purpose of this contract, the OWNER shall be the City of Farmington.

Payment Item - The estimated quantities of items listed in the Bid Proposal (Form AF-3) of these specifications for which the CONTRACTOR will be paid at the unit bid prices.

Person - Any individual, firm, association, partnership, corporation, trust, or joint venture.

Project - The entire construction to be performed as provided in the Contract Document.

Proposal - The offer of a Bidder, on the prescribed form, to perform the Work and to furnish the labor and materials at the prices quoted. (Form AF-3)

Proposal Guarantee - Cash, certified check, cashier's check, money order, or Bidders' Surety Bond executed by a bona fide Surety Company, which is authorized to transact business in the State of New Mexico accompanying the proposal as a guarantee that the Bidder, if awarded the contract, will enter into the Contract with the OWNER for the performance of the Work. (Form AF-6)

Reference Specifications, Test Methods, and Applicable Codes - All standard specifications and test methods of any society, association, or organization referred to in these Contract Documents are made a part of the same as if written in full. (Any reference to a paragraph or subparagraph within a section shall include all general provisions of the section to which reference is made). Reference to such standards refer to the latest published issues as of the date of the Invitation to Bid. Reference to local or state codes and laws shall mean the latest adopted and published codes as of the date of the Invitation to Bid.

Resident Project Representative The authorized representative of OWNER who is assigned to the Project site or any part thereof.

Roadway - That portion of the right-of-way or easement intended for use by vehicle traffic.

Rock Excavation - The use of high explosives, pneumatic or hydraulic equipment in trenching operations as determined by the Engineer.

Service Connection - All or any portion of the pipe, conduit, cable, or duct which connects a utility main or distribution line to a meter box or property line of an individual user.

Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by CONTRACTOR, Subcontractor, manufacturer, supplier, or distributor and which illustrate the equipment, material, or some portion of the Work.

Special Conditions - Conditions which are written for a specific Project and which modify any section or paragraph of the Condition of Contract.

Specifications, also Technical Specifications - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work.

State - The State of New Mexico.

Street - Any road, highway, parkway, freeway, alley, walk, or way including all area within the right-of-way.

Subcontractor - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

Substantial Completion - The date as certified by OWNER when the construction of the Project or a specified part thereof is sufficiently completed, all punch list items completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it was intended; or if there be no such certification, the date when final payment is due in accordance with paragraph 14.12. (Form AF-16)

Supplementary Specifications - Specifications which are written to modify any section or paragraph of the Technical Specifications of this document.

Surety - The bondsman, party or parties who may guarantee the fulfillment of the Contract by Bond.

Units of Measurement - Measurements shall be in accordance with U.S. Standard Measures. A pound shall be avoirdupois. A ton shall be 2,000 pounds. The unit of liquid measure shall be the U.S. gallon.

Utility - Overhead or underground wires, pipe lines, conduits, ducts or structures, operated and maintained in or across a public right-of-way or easement or private easement.

- A. Public Utility - Owned and operated by a municipality or another political subdivision of the State.
- B. Private Utility - Owned and operated by a private company or corporation.

Work - Any and all obligations, duties, and responsibilities necessary to the successful completion of the Project assigned to or undertaken by CONTRACTOR under the Contract Documents, including all labor, materials, equipment, and other incidentals, and the furnishing thereof.

Worksite - The specific location of the Project.

SECTION 2 - Preliminary Matters

2.1. Execution of Agreement - The Agreement and such other required Contract Documents will be signed by the CONTRACTOR and returned to the OWNER within ten (10) days after the Notice of Award has been received by the CONTRACTOR. If the Contract is not executed by the OWNER within thirty (30) days following receipt from the CONTRACTOR of the signed Agreement and other required Contract Documents, the CONTRACTOR shall have the right to withdraw the Proposal without penalty. No Contract shall be effective until it has been fully executed by all of the parties thereto.

2.2. Delivery of Bonds - When CONTRACTOR delivers the executed Agreement to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as he may be required to furnish in accordance with paragraph 5.1.

2.3. Copies of Documents - OWNER shall furnish to CONTRACTOR one fully executed copy of the Contract Documents unless otherwise provided in the Special Conditions. Additional copies will be furnished upon request.

2.4. CONTRACTOR's Pre-Start Representations - CONTRACTOR represents that he has familiarized himself with and assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions and federal, state, and local laws, ordinances, rules and regulations that may in any manner affect performance of the Work and represents that he has correlated his study and observations with the requirements of the Contract Documents. CONTRACTOR also represents that he has studied all surveys and investigation reports of subsurface latent physical conditions referred to in the Specifications and made such additional surveys and investigations as he deems necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents and that he has correlated the results of all such data with the requirements of the Contract Documents.

2.5. Commencement of Contract Time; Notice to Proceed - The Contract Time will commence to run on the day indicated in the Notice to Proceed.

2.6. Starting the Project - CONTRACTOR shall start to perform his obligations under the Contract Documents within ten (10) days of the date when the Contract Time commences to run. No Work shall be done at the Worksite prior to the date on which the Contract Time commences to run unless authorized by the Engineer.

2.7. Before Starting Construction - Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. He shall immediately report in writing to OWNER any conflict, error or discrepancy which he may discover; however, he shall not be liable to OWNER for his failure to discover any conflict, error, or discrepancy in the Drawings or Specifications.

2.7.1. Within ten (10) days after delivery of the executed Agreement by OWNER to CONTRACTOR, CONTRACTOR shall submit to OWNER for approval an estimated progress schedule indicating the starting and completion dates of the various stages of the Work and a preliminary schedule of Shop Drawing Submissions.

2.7.2. Within twenty (20) days after delivery of the executed Agreement by OWNER to CONTRACTOR, but before starting the Work at the Worksite, a conference will be held to review the above schedules, to establish procedures for handling Shop Drawings and other submissions and for processing Applications for Payment, and to establish a working understanding between the parties as to the Project. Present at the conference will be OWNER or his representative, Resident Project Representative, CONTRACTOR and his Superintendent.

2.7.3. The award of Contract, if it be awarded, will be made to the lowest responsible and qualified Bidder whose Proposal complies with all the requirements prescribed, for the Work at all locations shown on the plans and called for on the Bid Proposal.

SECTION 3 - CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

3.1. It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between OWNER and CONTRACTOR. They may be altered only by a Modification.

3.2. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If CONTRACTOR finds a conflict, error, or discrepancy in the Contract Documents, he shall call it to OWNER's attention in writing at once and before proceeding with the Work affected thereby; however, he shall not be liable to OWNER for his failure to discover any conflict, error, or discrepancy in the Specifications or Drawings. In resolving such conflicts, errors, and discrepancies, the documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Special Conditions, Instructions to Bidders, General Conditions, Specifications, and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings. Any Work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials, or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

3.3. It shall be the CONTRACTOR's responsibility to advise the OWNER no later than ninety-six (96) hours prior to the Bid opening date of conflicting requirements, or missing information which requires clarification of the Specifications.

SECTION 4 - AVAILABILITY OF LANDS, PHYSICAL CONDITIONS, REFERENCE POINTS

4.1. Availability of Lands - OWNER shall furnish, as indicated in the Contract Documents and not later than the date when needed by CONTRACTOR, the lands upon which the Work is to be done, rights-of-way for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise specified in the Contract Documents. If CONTRACTOR believes that any delay in OWNER's furnishing these lands or easements entitles him to an extension of the Contract Time, he may make a claim therefor as provided in Section 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2. Physical Conditions - The OWNER will, upon request, furnish to the CONTRACTOR copies of all boundary surveys, subsurface tests, and other pertinent reports and material which are available in OWNER's office. OWNER does not warrant that these surveys, tests and reports are in any way indicative of the actual conditions existing on the Worksite.

4.3. Unforeseen Physical Conditions - CONTRACTOR shall promptly notify OWNER in writing of any subsurface or latent physical conditions at the Worksite differing materially from those indicated in the Contract Documents. Promptly thereafter OWNER shall obtain the necessary additional surveys and tests and furnish copies to CONTRACTOR. If OWNER finds that the results of such surveys or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents and which could not reasonably have been anticipated by CONTRACTOR, a Change Order shall be issued incorporating the necessary revisions.

4.4. Reference Points - The OWNER will provide construction staking and surveying from base lines, grades, and bench marks shown on the plans or established by the OWNER. Any discrepancies in design or base lines and grades revealed in construction operations shall be brought to the OWNER's attention immediately for correction or clarification. If the CONTRACTOR elects to proceed with construction before such corrections or clarifications are made, he shall do so at his own risk and expense, pending approval by the OWNER. Restaking or resetting of horizontal and vertical control points due to CONTRACTOR's negligence in preserving stakes or horizontal or vertical control points shall be at the CONTRACTOR's expense. The CONTRACTOR shall arrange his requests for staking so that, insofar as possible, the OWNER will be able to stake out in advance to avoid having the survey crew waiting "on call" for minor staking. At least 48 hours' notice shall be given the OWNER for commencement of staking, with sufficient time allowed for completion of staking requirements prior to commencement of the particular construction work.

The CONTRACTOR shall not move or disturb any monuments or other survey markers until the OWNER has referenced them and has given permission to move them. CONTRACTOR shall report to the OWNER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. CONTRACTOR shall replace and accurately relocate all reference points so lost, destroyed, or moved.

SECTION 5 - BONDS AND INSURANCE

5.1. Bonds - CONTRACTOR shall furnish a performance and a labor, material and tax payment bond upon the forms specified in the Contract Documents as security for the faithful performance and payment of all obligations under the Contract Documents. These Bonds shall be in amounts at least equal to the Contract Price and (except as may be otherwise provided in the Special Conditions, or by proper modification) with such sureties as are licensed to conduct business in the state where the Project is located and are named in the current list of Department of the Treasury's Listing of Approved Sureties (Department Circular 570), latest revision, as published by the U.S. CC-6

Treasury Department, Financial Management Service. The performance bond shall remain in effect through the Guarantee Period. (See paragraph 13.10) The Surety on the performance bond shall furnish a waiver whereby it consents to the progress or partial payment to the CONTRACTOR of amounts for materials under the provisions of paragraph 14.1.1 of these Conditions of Contract and acknowledges, in accordance with paragraphs 14.9 and 14.14 of said Conditions of Contract, that such payment, whether or not in strict compliance with these provisions shall not preclude or stop the OWNER from showing the true character and quantity of the materials furnished or from recovering from the CONTRACTOR or his sureties such damages as the OWNER may sustain by reason of deficiency in quantity or quality of the materials with respect to which a progress payment was made.

If the Surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located is revoked, CONTRACTOR shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to OWNER.

5.2. CONTRACTOR's Commercial General Liability Insurance - CONTRACTOR shall purchase and maintain such insurance as will protect him from claims for damages because of bodily injury, sickness, disease, or death of any person including claims insured by personal injury liability coverage, and from claims for injury to or destruction of tangible property, including loss of use resulting therefrom, any or all of which may arise out of or result from CONTRACTOR's operations under the Contract Documents, whether such operations be by himself or by any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be legally liable. This insurance shall include the types and specific coverages herein described and be written for not less than any limits of liability specified in these Contract Documents or required by law, whichever is greater. Insurance must include coverage for collapse (C), explosion (X), and underground (U) property damage; independent contractors, products/completed operations, contractual liability, broad form property damage, personal injury and assault and battery.

5.2.1 CONTRACTOR's Builder's Risk: CONTRACTOR shall purchase and maintain all risk insurance (Builder's Risk) upon the entire WORK at the site as well as upon materials and equipment in temporary storage both on and off the site with coverage limits equal to the CONTRACT PRICE.

5.3. Contractor's Automobile Liability Insurance - CONTRACTOR shall purchase and maintain such insurance as will protect him from claims for damages because of bodily injury, sickness, disease or death of any person; and from claims for injury to or destruction of tangible property, including loss of use resulting therefrom, any or all of which may arise out of or result from the use of all owned, non-owned, or hired, vehicles, both on and off Work, arising from or in any way related to or as the result of CONTRACTOR's operations under the Contract Documents, whether such operations be by the CONTRACTOR or by any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be legally liable.

5.4. CONTRACTOR's Workers' Compensation and Employers Liability Coverage

5.4.1. The CONTRACTOR shall comply with the provisions of the Workers' Compensation Act, the subsequent Injury Act, and CONTRACTOR shall procure and maintain during the life of this Contract Workers' Compensation and Employer's Liability Insurance in accordance with New Mexico laws and regulations. Such insurance shall include coverage permitted under Section 52-1-10 NMSA 1978 for safety devices. If the CONTRACTOR elects to be self-insured, he shall comply with the applicable requirements of law. If any portion of the Work is to be sub-let, the CONTRACTOR shall require the Subcontractor similarly to provide such coverage (or qualify as a self-insured) for all the latter's employees to be engaged in such Work. The OWNER, its officers, or employees will not be responsible for any claims or actions occasioned by the failure of the CONTRACTOR to comply with the provisions of this paragraph.

5.4.2. In case any class of employee is not protected under the Workers' Compensation Statute, the CONTRACTOR shall provide and shall cause each Subcontractor to provide adequate employer's liability coverage as will protect him and the OWNER against any claims resulting from injuries to and death of workers engaged in Work under this contract.

5.5. Coverage Limits - Insurance coverage limits required to be carried by the CONTRACTOR under this Section shall be as follows:

5.5.1. CONTRACTOR's Commercial General Liability Insurance and CONTRACTOR's Commercial Automobile Liability Insurance limits of coverage shall be the limits established by the New Mexico Tort Claims Act or:

5.5.1.1. Combined Single Limit coverage of \$1,000,000

5.5.2. CONTRACTOR's Workers Compensation coverage shall be those established by applicable statutes. Employer's liability coverages shall be the limits established by the New Mexico Tort Claims Act or \$1,000,000.

5.5.3. OWNER's protective liability insurance limits shall be the same as specified in subsection 5.5.1. for CONTRACTOR's Commercial General Liability Insurance.

5.6. Certificates of Insurance - CONTRACTOR shall include as part of the Contract Documents certificates of insurance on forms acceptable to the OWNER. The Certificates of Insurance shall evidence that all coverages, limits, and endorsements required herein are in full force and effect. Such Certificates of Insurance shall also reference this Agreement/Contract number. With respect to any insurance policy referenced on a Certificate of Insurance, CONTRACTOR will (or he will cause the respective insurance carrier to) provide the OWNER with a minimum thirty (30) calendar days written notice in the event of cancellation, termination, non-renewal, or any other material change. Any such notice shall also include copies of the non-renewal or cancellation notice originated by the insurance carrier. Written notice may be submitted via fax, courier, or postal service, in accordance with the notice provision herein.

5.7. Owner's Protective Liability Insurance - The CONTRACTOR shall procure and maintain during the life of the contract an Owner's protective liability insurance policy. The policy will be written with the OWNER as the named insured and will provide coverage for the OWNER's officers and employees while acting within the scope of their duties against all claims arising out of or in connection with the Work to be performed. The policy shall provide the minimum limits as specified in the Contract Documents (except as may be otherwise specified in the Special Conditions or by proper Change Order).

5.8. Additional Bonds and Insurance - Prior to delivery of the executed Agreement by OWNER to CONTRACTOR, OWNER may require CONTRACTOR to furnish such other Bonds and such additional insurance, in such form and with such sureties or insurers, as OWNER may require. If such other Bonds or such other insurers are specified by written instructions given prior to opening of Bids, the premiums shall be paid by CONTRACTOR; if subsequent thereto, they shall be paid by OWNER (except as otherwise provided in paragraph 6.7).

5.9. OWNER Named as Additional Insured, Cross Liability Provisions, and Waiver of Subrogation - The OWNER shall be named as an additional insured on all policies and all policies shall include cross liability provisions. Workers' Compensation and Commercial General Liability Insurance coverage shall include a waiver of subrogation in favor of the OWNER.

5.10. In General - It is the intent of the specifications of insurance requirements above that the CONTRACTOR shall maintain in force the broadest commonly available coverage against the risks and perils listed above, in the Special Conditions, or in Instructions pursuant to Paragraph 5.8 above. If insurance against the listed risks and perils is commonly available, the failure to specify such insurance shall not

relieve CONTRACTOR from its duty to maintain such insurance. Review of CONTRACTOR's insurance by the OWNER shall not relieve or increase the liability of CONTRACTOR. Also, the specification of any insurance in the Contract Documents does not limit any of the other obligations of CONTRACTOR under those documents. In each insurance policy, CONTRACTOR shall provide either in printed text or by endorsement that it shall be primary with respect to the interest of the OWNER, and any insurance maintained by the OWNER is in excess and not contributory to CONTRACTOR's insurance policies regardless of any like insurance coverages that the OWNER may have. Nothing in this Agreement/Contract shall be deemed to limit CONTRACTOR's liability under this Agreement/Contract to the limits of the insurance coverages required hereunder. CONTRACTOR shall be solely responsible for payment of all deductible or retention amounts pertaining to any insurance required hereby.

SECTION 6 - CONTRACTOR'S RESPONSIBILITIES

6.1. Supervision and Superintendence - CONTRACTOR shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction; but he shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence, or procedure of construction which is indicated in and required by the Contract Documents.

CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.2. CONTRACTOR shall keep on the Worksite at all times during its progress a competent resident superintendent, who shall be on twenty-four (24) hour call until completion of the Work, and shall not be replaced without written notice to OWNER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Worksite and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

6.2.1. The CONTRACTOR shall provide to the OWNER the name and telephone number of the resident superintendent and a telephone number at which the superintendent can be contacted twenty-four (24) hours a day until completion of the Work, and a list of key personnel and telephone numbers for use in case of emergencies.

6.3. Labor, Materials, and Equipment - CONTRACTOR shall provide competent, suitably qualified personnel to lay out the Work and perform construction as required by the Contract Document. He shall at all times maintain good discipline and order at the Worksite.

6.4. CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, initial operation, and completion of the Work.

Necessary sanitary conveniences for the use of the laborers on the Project, properly secluded from public observation, shall be provided and maintained in sanitary condition by the CONTRACTOR and their use shall be directly enforced.

6.5. All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by OWNER, CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

6.5.1. Where applicable, materials used in this project shall comply with the Public Works Contracts, Sections 13-4-5 through 13-4-9, Use of New Mexico Materials.

6.6. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processors, except as otherwise provided in the Contract Documents.

6.7. Substitute Materials or Equipment - If the Specifications, laws, ordinances or applicable rules or regulations permit CONTRACTOR to furnish or use a substitute that is equal to any material or equipment specified, and if CONTRACTOR wishes to furnish or use a proposed substitute, he shall, prior to the conference called for by paragraph 2.7.2, make written application to OWNER for approval of such a substitute certifying in writing that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified, and be suited to the same use and capable of performing the same function as that specified; stating whether or not its incorporation in or use in connection with the Project is subject to the payment of any license fee or royalty; and identifying all variations of the proposed substitute from that specified and indicating available maintenance service. No substitute shall be ordered or installed without the written approval of OWNER who will be the judge of equality and may require CONTRACTOR to furnish such other data about the proposed substitute as he considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as OWNER may require which shall be furnished at CONTRACTOR's expense.

6.8. Concerning Subcontractors - CONTRACTOR shall not employ any Subcontractor or other person or organization (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER may have reasonable objection. A Subcontractor or other person or organization identified in writing to OWNER by CONTRACTOR prior to the Notice of Award and not objected to in writing by OWNER prior to the Notice of Award will be deemed acceptable to OWNER. Acceptance of any Subcontractor, other person, or organization by OWNER shall not constitute a waiver of any right of OWNER to reject defective Work or Work not in conformance with the Contract Documents. If OWNER, after due investigation, has reasonable objection to any Subcontractor, other person, or organization proposed by CONTRACTOR after the Notice of Award, CONTRACTOR shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued.

CONTRACTOR shall not be required to employ any Subcontractor, other person, or organization against whom he has reasonable objection. CONTRACTOR shall not without the consent of OWNER make any substitution for any Subcontractor, other person, or organization who has been accepted by OWNER.

6.9. CONTRACTOR shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between OWNER and any Subcontractor or other person or organization having a direct contract with CONTRACTOR, nor shall it create any obligation on the part of OWNER to pay or to see to the payment of any monies due any Subcontractor or other person or organization, except as may otherwise be required by law. OWNER may furnish to any Subcontractor or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR on account of specific Work done in accordance with the schedule of values.

6.10. The sections of the Specifications and the identifications of any drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or delineating the Work to be performed by any specific trade.

6.11. CONTRACTOR agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER.

6.12. Patent Fees and Royalties - CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, product, or

device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of OWNER, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER or anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses, including attorneys' fees, arising out of any infringement of patent rights or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents and shall defend all such claims in connection with any alleged infringement of such rights.

6.13. Permits and Licenses - CONTRACTOR shall obtain and pay for all construction permits and licenses and shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of his Bid. CONTRACTOR shall also pay all public utility charges.

6.13.1. The CONTRACTOR shall, upon request by the OWNER, be prepared to present evidence of current State of New Mexico Contractor's License and a City of Farmington, New Mexico occupation license or business registration.

6.14. Laws and Regulations - CONTRACTOR shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the Work. If CONTRACTOR observes that the Specifications or Drawings are at variance therewith, he shall give OWNER prompt written notice thereof; and any necessary changes shall be adjusted by an appropriate Modification. If CONTRACTOR performs any Work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to OWNER, he shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules, and regulations.

6.15. Taxes - CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by him in accordance with the laws.

Pursuant to Section 13-1-108 NMSA 1978, the total amount Bid shall exclude all applicable taxes including applicable state gross receipts tax or applicable local option tax. The OWNER will reimburse CONTRACTOR for any taxes due on the Contract including any increase in applicable taxes which become effective after the date the Contract is entered into. Taxes shall be shown as a separate amount on each billing or request for payment and shall separately identify each tax being billed.

To assist the OWNER with budget preparation, the Bidder shall complete the Bidder's Estimate of Taxes (Form AF-4) and shall identify by name each tax Bidder believes to be applicable to this Contract and shall estimate the amount of each tax which will be charged on the entire contract.

If applicable, OWNER may elect to perform a cost segregation study for New Mexico gross receipts tax deduction purposes relative to gross receipts taxes paid on a facility construction project under this Contract. Cost segregation in general, is the process of identifying and classifying building property components as tangible personal property due to the ability to depreciate said components over a shorter life span when the identified assets are able to meet criteria established under federal case law and treasury regulations. A cost segregation analysis seeks a deduction for gross receipts taxes paid on the sale of certain assets identified through the study as tangible personal property. OWNER will notify CONTRACTOR if it has decided to perform a cost segregation analysis on this facility construction project and CONTRACTOR agrees to cooperate in providing the necessary information required for the cost segregation study. OWNER may hire a third party provider (hereafter "Provider") to perform this analysis (in whole or in part) on OWNER's behalf and CONTRACTOR agrees to cooperate with such Provider (to be named at an appropriate time).

6.16. Use of Premises - CONTRACTOR shall confine his equipment, the storage of materials and equipment, and the operations of his workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents and shall not unreasonably encumber the premises with materials or equipment.

The CONTRACTOR shall not trespass upon public or private property without permission to do so and shall, at all times, take proper precautions to protect public and private property from damage. Means of ingress and egress shall be provided for all persons living and working on streets in which Work is being done. All sidewalks, public walkways and drainage gutters; drainage ways shall be open, and fire hydrants and water system valves shall be left accessible for use at all times.

6.16.1. The CONTRACTOR shall never unnecessarily interfere with or interrupt the services of any public utility having property within or adjacent to the streets, alleys and easement involved in the Work and shall take all necessary precaution and effort to locate and protect all underground conduit, cables, pipes, water mains, sewers, structures, gas lines, trees, monuments, power lines, telephone and telegraph lines, traffic control devices and other structures, both below and above ground. He shall give all Public Utility Companies a reasonable notice in writing, in no event less than forty-eight (48) hours, for any Work that he contemplates which would interfere in any way whatsoever with the service of any existing public utility and OWNER owned facilities. If such public utility does not cooperate for the protection of its service, the CONTRACTOR shall promptly notify the OWNER's Inspector. Utility lines shall be located by the CONTRACTOR far enough in advance of construction Work in order that the owner of such lines may raise, lower, realign or remove lines and structures, if necessary, and in order that the OWNER may make any line and grade changes necessary should the existing utility lines conflict with the Work under construction providing such adjustments do not materially affect the Work. The CONTRACTOR shall immediately report any damages to property to the company or owner involved and to the OWNER.

6.16.2. Underground Structures - It shall be the responsibility of the CONTRACTOR to locate each and every utility in advance of construction to preclude damage to these lines. The appropriate utility company shall be notified a minimum of forty-eight (48) hours in advance of the construction, and any damage resulting from construction shall be the responsibility of the CONTRACTOR.

Any interference with, or damage to, either underground or above ground utilities of any nature shall be the CONTRACTOR's legal and financial responsibility, saving the OWNER harmless from any or all claim resulting from damage to these utilities by reason of his operations incidental to the Work.

Notification shall be made through use of the "New Mexico One Call" by calling (telephone number 1-800-321-2537) or by direct call to appropriate utility company.

COLOR CODING FOR THE BLUE STAKE PROGRAM

White..... City of Farmington Traffic
Red..... City of Farmington Electrical
Green..... City of Farmington Sewer
Blue..... City of Farmington Water
Orange... Telephone Co. & Cable Television
Yellow.... Gas Company of New Mexico

In the event that a utility is disclosed during excavation that requires additional Work on the part of the CONTRACTOR for its maintenance, relocation or support, the following procedures will apply:

6.16.2.1. When a utility is found to occupy the space to be occupied by a part of the permanent Works to be constructed, or when the utility is, in the opinion of the Inspector, in such close proximity to the new Work as to require the relocation or alteration of this utility, the OWNER will arrange for such relocation or alteration.

6.16.2.2. With the exception of Service Connections, when a utility lies within the excavation, but does not intercept the permanent

Work to be constructed, the CONTRACTOR shall maintain the line in place. All costs for such work shall be borne by the CONTRACTOR.

6.16.3. Traffic Control and Work in the Right-of-Way

6.16.3.1. The CONTRACTOR shall conduct his operation to cause the minimum inconvenience to traffic and shall provide, and continually maintain (except during the time of paving), a smooth and drained street over which vehicular traffic can move safely and under its own power, regardless of weather conditions. These provisions apply to continuous use by traffic both day and night.

At the pre-construction conference, the CONTRACTOR shall designate one of his employees, other than the Superintendent, to be responsible for traffic control. This responsibility shall include the CONTRACTOR's signing and all other details covered by the Specifications which contribute to the comfort and safety of the traveling public.

Work in the travelway must meet the requirements set forth in the MUTCD.

After backfilling of the trench and prior to repaving of the streets, it shall be the responsibility of the CONTRACTOR to maintain relatively smooth access to driveways.

The CONTRACTOR shall construct and maintain temporary crossings, complete with flagmen, whenever necessary to expedite the Work or to maintain traffic. Temporary crossings shall be of ample size to carry safely the loads which will use them. The cost of labor, materials, tools, and equipment for traffic control shall be the responsibility of the CONTRACTOR, and no separate or additional payment will be made, unless otherwise specified.

6.16.3.2. Maintenance of Right-of-Way During Construction: The CONTRACTOR shall keep all travel lanes, ditches, gutters, medians and drop inlets clean of debris and maintained during construction until final acceptance.

The CONTRACTOR shall provide, when required, a safe substitute route (detour) for any public right-of-way obstructed or occupied by his operations and shall erect and maintain all necessary barricades, warning, signs, detour signs, route signs, route markers, according to plans approved by the Engineer and as specified herein. He shall take all necessary precautions for the protection of the Work and the safety of his employees and of the public.

The CONTRACTOR shall provide suitable means, by sprinkling or otherwise, for the abatement of dust conditions in the construction area and on access and detour roads.

Whenever a street or thoroughfare is to be closed or to be partially closed, the CONTRACTOR shall notify the Engineer or his Designated Representative, phone number (505) 599-1311 of such closing and the length of time the street will be closed to traffic. This notice shall be given forty-eight (48) hours prior to closing, and at that time, a detour plan shall be submitted for approval to the Engineer. In order that the traveling public and business establishments along the streets be inconvenienced as little as possible, the CONTRACTOR shall restore the street surface as quickly as possible. The CONTRACTOR shall notify the Engineer prior to the opening of any street after a street has been closed for any length of time.

If CONTRACTOR fails to comply with orders of the Engineer regarding repaving, the Engineer may require the CONTRACTOR to cease progress on any or all parts of the Work under Contract until the unsatisfactory condition is corrected. The Engineer may order such repaving work to be performed by others, and the costs of this repaving may be deducted from payments due the CONTRACTOR. No additional compensation will be allowed as a result of such suspension.

The CONTRACTOR shall contact the Engineer in writing or in person forty-eight (48) hours prior to the beginning of construction work on any public street, alley or easement, which in any manner will interfere with

traffic. Together, they shall establish an orderly sequence of construction operations which will minimize interference with traffic.

Excavated material shall be placed along the line of Work in a manner to cause as little inconvenience as possible to public travel and access to abutting property.

6.16.3.3. Barricades and Warning Signs: The CONTRACTOR shall at his expense and without further order other than the awarding of the contract, provide, erect and maintain at all times during the process of the Work or during a temporary suspension of Work, barricades, warning signs and other approved protection.

Warning Signs shall be placed in accordance with the latest edition of part VI of the MUTCD. The furnishing, installing and maintaining of traffic control devices, the furnishing and equipping of flagmen shall be considered incidental to the completed Work and no payment will be made therefore.

Failure to comply with barricading requirement: After more than two warnings, should the CONTRACTOR fail to install and maintain the necessary barricading the OWNER will install and maintain the required barricading. Fee for this work will be charged against the Project and deducted from the next Application for Payment. The fee will be determined by the prevailing barricade rental and maintenance rates.

6.16.3.4. Project Sign: Each Worksite shall display a weatherproof sign which shall be carefully maintained during the life of the contract. Signs shall not be smaller than 2' x 4' except to meet special requirements and will be placed at the end of the Project. The signs will state the contractor's name, Work being done for the OWNER and applicable Contract number. No other information shall be included on Project signs. All costs for such work shall be borne by the Contractor. Each project sign shall be removed from the work-site and disposed of properly, by the Contractor, no later than thirty (30) calendar days following the substantial completion date, or prior to final payment, whichever occurs first.

6.17. The CONTRACTOR shall restore at his own expense any public, City owned, or private property damage for which he is directly or indirectly responsible to a condition equal to that existing before damage. If he fails to do so, or refuses to do upon notice, the OWNER may cause such restoration and deduct cost from monies due, or which may become due the CONTRACTOR.

6.17.1. CONTRACTOR shall confine his equipment, the storage of materials and equipment, and the operations of his workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents and shall not unreasonably encumber the premises with materials or equipment.

6.17.2. CONTRACTOR shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall he subject any part of the Work to stresses or pressures that will endanger it.

6.18. Record Drawings - CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, and Shop Drawings at the Worksite in good order and annotated to show all changes made during the construction process. These shall be provided to OWNER and shall be delivered to him upon completion of the Project and prior to final payment.

6.19. Safety and Protection -The safety provisions of applicable federal, state and municipal laws, ordinances, and regulations, building and construction codes shall be observed and adhered to. Machinery, equipment and other physical hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, and Federal Regulations (OSHA), to the extent that such provisions are not incompatible with existing applicable laws and regulations. Every precaution shall be exercised at all times by the CONTRACTOR and his Subcontractors for the protection and safety of employees, OWNER personnel, and other persons including children on CC-10

or near the Project. CONTRACTOR shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury, or loss to:

6.19.1. all employees on the Worksite and other persons who may be affected thereby;

6.19.2. all the Work and materials or equipment to be incorporated therein, whether in storage on or off the Worksite; and

6.19.3. other property at the Worksite or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

The CONTRACTOR shall conduct his operations in a manner which will minimize interference with the normal use of property adjacent to the construction Work and shall give owners of such property at least twenty-four (24) hours' notice of the commencement of Work in the area abutting their property. CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for its safety and protection. All damage, injury, or loss to any property referred to in subparagraph 6.19.2 or 6.19.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, and Subcontractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR, except damage or loss attributable to the fault of drawings or Specifications or to the acts or omissions of OWNER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR. CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.12 that Work is acceptable.

Additional and more specific requirements may be made in the specifications which form a part of this contract; however, such requirements shall always be in addition to, and not in lieu of, the provisions of this section. The CONTRACTOR shall conduct his construction operations and control the storage of equipment and materials on the job in such a manner as to prevent the maintaining of an attractive nuisance which may encourage children to play in and about the Work area. The precautions shall be taken on no further order from the OWNER other than the execution of these Contract Documents by the CONTRACTOR.

6.20. CONTRACTOR shall designate a responsible member of his organization at the Worksite whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent, unless otherwise designated in writing by CONTRACTOR to OWNER.

6.21. Emergencies - In emergencies affecting the safety of persons or the Work or property at the Worksite or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER, is obligated to act at his discretion to prevent threatened damage, injury, or loss. He shall give OWNER prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby; and a Change Order shall thereupon be issued covering the changes and deviations involved. If CONTRACTOR believes that additional work done by him in an emergency which arose from causes beyond his control entitles him to an increase in the Contract Price or an extension of the Contract Time, he may make a claim therefor as provided in Section 11 and 12.

6.22. Shop Drawings and Samples - After checking and verifying all field measurements, CONTRACTOR shall submit to OWNER for approval, in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.7.1), five copies (or, at OWNER's option, one reproducible copy) of all Shop Drawings which shall have been

checked by and stamped with the approval of CONTRACTOR and identified as OWNER may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction, and the like to enable Engineer to review the information as required.

6.23. CONTRACTOR shall also submit to OWNER for approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of CONTRACTOR, identified clearly as to material, manufacturer, and pertinent catalog numbers and the use for which intended.

6.24. At the time of each submission, CONTRACTOR shall in writing call Engineer's attention to any deviations that the Shop Drawings or sample may have from the requirements of the Contract Documents.

6.25. The OWNER will review and approve with reasonable promptness Shop Drawings and samples, but his review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make any corrections required by OWNER and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. CONTRACTOR shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by OWNER on previous submissions. CONTRACTOR's stamp of approval on any Shop Drawing or sample shall constitute a representation to owner that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or he assumes full responsibility for doing so and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the Work and the Contract Documents.

6.26. Where a Shop Drawing or sample submission is required by the Specifications, no related Work shall be commenced until the submission has been approved by OWNER. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by CONTRACTOR at the Worksite and shall be available to OWNER.

6.27. OWNER's approval of Shop Drawings or samples shall not relieve CONTRACTOR from his responsibility for any deviations from the requirements of the Contract Documents unless CONTRACTOR has in writing called OWNER's attention to such deviation at the time of submission and OWNER has given written approval to the specific deviation, nor shall any approval by OWNER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings.

6.28. Cleaning - Throughout the period of construction, the CONTRACTOR shall keep the Worksite free and clean from all rubbish and debris. The CONTRACTOR shall promptly clean up all or any portion of the Worksite when notified to do so by the OWNER. Adjacent streets and highways shall be kept free of dirt and litter from CONTRACTOR's handling operations. The CONTRACTOR shall take reasonable precautions to protect private property adjacent to the Project from such nuisances as dust and dirt, rock and excessive noise. Care shall be taken to prevent spillage on streets over which hauling is done, and any such spillage or debris deposited on streets due to the CONTRACTOR's operations shall immediately be cleaned up. The CONTRACTOR shall promptly remove from any parts of the working area all unused materials, surplus earth, and debris, to the end that construction areas are returned to a clean, neat, and acceptable condition at the earliest time following completion of the Work.

In the event that the CONTRACTOR fails to comply with orders of the OWNER regarding cleanup, the OWNER may require the CONTRACTOR to cease progress on any or all parts of the Work under Contract until the unsatisfactory condition is corrected. The OWNER may order such cleanup work performed by others and the costs therefor deducted from payments due the CONTRACTOR. No additional compensation will be allowed as a result of such suspension.

Salvageable Material: All material deemed salvageable from existing OWNER facilities, which are to be abandoned shall remain the property of the OWNER. Salvageable materials shall be delivered to the Municipal Operation Center (MOC). The Engineer will determine the location for disposition of salvageable material. Material deemed not salvageable shall be the CONTRACTOR's property and shall be disposed of in accordance with Local, State and Federal Rules, Regulations and Laws.

6.28.1. During all phases of the construction Work, the Contractor shall take precautions to abate dust nuisance by cleaning up, sweeping, sprinkling with water, or other means as necessary to accomplish results satisfactory to the Engineer.

6.29. Indemnification - CONTRACTOR shall indemnify and hold harmless OWNER and its agents and employees from and against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from the performance of the Work by the CONTRACTOR, to the extent that any such claim, damage, loss, or expense (a) is attributable to bodily injury, sickness, disease, or death or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder, except as limited by paragraph 6.31.

6.30. In any and all claims against OWNER or his agent or employees by and employees of CONTRACTOR, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.29 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any Subcontractor under Workers' Compensation acts, disability benefit acts, or other employee benefit acts.

6.31. The obligations of CONTRACTOR under paragraph 6.29 shall not extend to the liability of OWNER, his agents, or employees arising out of (a) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications by the OWNER or the agents or employees of the specifications by the OWNER or the agents or employees of the OWNER, or (b) the giving of or the failure to give directions or instructions by OWNER, his agents, or employees where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

6.32. Continuing the Work - CONTRACTOR shall carry on the Work and maintain the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as CONTRACTOR and OWNER may otherwise agree in writing.

SECTION 7 - WORK BY OTHERS

7.1. OWNER may perform additional work related to the Project by himself, or he may let other related direct contracts which shall contain General Conditions similar to these. CONTRACTOR shall afford the other contractors who are parties to such direct contracts (or OWNER, if he is performing the additional work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of work and shall properly connect and coordinate CONTRACTOR'S work with theirs.

7.2. If any part of CONTRACTOR's Work depends for proper execution of results upon the work of any such other contractor (or OWNER), CONTRACTOR shall inspect and promptly report to OWNER in writing any defects or deficiencies in such work that render it unsuitable for such proper execution and results. CONTRACTOR'S failure to report shall constitute an acceptance of the work as fit and proper for the relationship of his work except as to defects and deficiencies which may appear in the other work after the execution of his work.

7.3. CONTRACTOR shall do all cutting, fitting, and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter other contractor's work with the written consent of OWNER and of the other contractors whose work will be affected.

7.4. If the performance of additional work by other contractors or OWNER is not noted in the Contract Documents prior to the execution of the contract, written notice thereof shall be given to CONTRACTOR prior to starting any such additional work. If CONTRACTOR believes that the performance of such additional work by OWNER or others involves him an additional expense or entitles him to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Sections 11 and 12.

SECTION 8 - OWNER'S RESPONSIBILITIES

8.1. OWNER shall issue all communications to CONTRACTOR through the Engineer or other Designated Representative.

8.2. In case of termination of the employment of the Engineer, OWNER shall appoint an engineer whose status under the Contract Documents shall be that of the former Engineer. Any Dispute in connection with such appointment shall be subject to arbitration.

8.3. OWNER shall furnish the data required of it under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.6.3 and 14.12.

8.4. OWNER's duties in respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of surveys and investigation reports of subsurface and latent physical conditions at the Worksite or otherwise affecting performance of the Work which have been relied upon by Engineer in preparing the Drawings and Specifications.

8.5. In addition to its rights to request changes in the work in accordance with Section 10, OWNER (especially in certain instances as provided in paragraph 10.4) shall be obligated to execute Change Orders.

8.6. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.2.

8.7. In connection with OWNER's right to stop work or suspend work, see paragraphs 13.8 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

SECTION 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.1. To prevent delays and Disputes, and to discourage litigation, the parties to this Contract agree that the Engineer or other Designated Representative shall determine the quantities of work which are to be paid for under the Contract, and shall determine all questions in relation to the work. If the Designated Representative is other than an engineer normally employed by OWNER, the Special Conditions or an Addendum will specify that person's duties relative to those specified for the Engineer under this Contract.

SECTION 10 - CHANGES IN WORK

10.1. Without invalidating the Agreement, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the work; these will be authorized by Change Orders. Upon receipt of a Change Order, CONTRACTOR shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Section 11 or Section 12 on the basis of a claim made by either party.

10.2. OWNER may authorize minor changes or alterations in the Work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order.

If CONTRACTOR believes that any minor change or alteration authorized by OWNER entitles him to an increase in Contract Price, he may make a claim therefor as provided in Section 11.

10.3. Additional work performed by CONTRACTOR without authorization of a Change Order will not entitle him to an increase in the Contract Price or an extension of the Contract Time, except in the case of an emergency as provided in Paragraph 6.21 and except as provided in paragraphs 10.2 and 13.7.

10.4. OWNER shall execute appropriate Change Orders covering changes in the Work to be performed as provided in paragraph 4.3 and Work performed in an emergency as provided in paragraph 6.21 and any other claim of CONTRACTOR for a change in the Contract Time or the Contract Price which is approved by OWNER.

10.5. It is CONTRACTOR's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price, and the amount of the applicable Bonds shall be adjusted accordingly. CONTRACTOR shall furnish proof of such adjustment to OWNER upon request.

SECTION 11 - CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation payable to CONTRACTOR for performing the Work. All duties, responsibilities, and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to OWNER within fifteen (15) days of the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data shall be delivered within forty-five (45) days of such occurrence unless OWNER allows an additional period of time to ascertain accurate cost data. All claims for adjustments in the Contract Price shall be determined by OWNER. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order. Failure to comply with the time requirements in this Paragraph operates as an express waiver of any right to make a claim for adjustment in the Contract Price. Contractor's signature on a Change Order acts as an express waiver to seek any additional costs or time as a result of the work described in the Change Order.

11.3. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.

11.3.2. By mutual acceptance of a lump sum or unit prices.

11.3.3. On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a Contractor's Fee for overhead and profit (determined as provided in paragraph 11.6. Whenever Extra Work to be compensated on this basis is performed, the CONTRACTOR shall

supply the OWNER with a list of the names of the personnel who performed the Extra Work, together with the hours on the job, and group classification of each such person.

11.4. Cost of the Work - The term Cost of the Work means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the work shall be apportioned on the basis of their time spent on the work. Payroll costs shall include salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, Workers' Compensation, health and retirement benefits, sick leave, vacation and Holiday pay applicable thereto. Such employees shall include superintendents and foremen at the Worksite. The expenses of performing Work after regular working hours, on Sunday or legal Holidays shall be included in the above to the extent authorized by OWNER.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the OWNER. All trade discounts, rebates, and refunds and all returns from sale of surplus materials and equipment shall accrue to OWNER; and CONTRACTOR shall make provisions so that they may be obtained.

11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to him and shall deliver such bids to OWNER who will then determine which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Cost of the Work shall be determined in accordance with paragraphs 11.4 and 11.5. All subcontracts shall be subject to the other conditions of the Contract Documents insofar as applicable.

11.4.4. Costs of special consultants (including, but not limited to, engineers, architects, testing laboratories, surveyors, and accountants) employed for services specifically related to the Work.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, traveling, and subsistence expense of CONTRACTOR's employees incurred in discharge of duties connected with the work.

11.4.5.2. Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site, and hand tools not owned by the workmen, which are consumed in the performance of the Work; and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

11.4.5.3. The ownership value of all construction equipment and machinery for the time actually employed in the Work under this section.

11.4.5.4. Rentals of all construction equipment and machinery and the parts thereof when rented from other than the CONTRACTOR and the costs of transportation, loading, unloading, installation, dismantling, and removal thereof shall be paid at the lesser of actual costs or those established in accordance with rental rates from the Rental Rate Blue Book (latest edition) as obtained from: Primedia Information Incorporated, 1735 Technology Drive, Suite 410, San Jose, CC-13

CA 95110 or successor organization. The rental of any such equipment, machinery, parts shall cease when the use thereof is no longer necessary for the Work.

11.4.5.5. Sales, use, or similar taxes related to the work and for which CONTRACTOR is liable, imposed by any governmental authority.

11.4.5.6. Deposits lost for causes other than CONTRACTOR's negligence, royalty payments, and fees for permits and licenses.

11.4.5.7. Losses, damages, and expenses not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the execution of and to the Work, provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER.

No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, he shall be paid for his services a fee proportionate to that stated in paragraph 11.6.

11.4.5.8. The cost of utilities, fuel, and sanitary facilities at the site.

11.4.5.9. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the work.

11.4.5.10. Increased cost of premiums for Bonds and insurance which OWNER is required to pay in accordance with paragraph 5.8.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, timekeepers, clerks, and other personnel employed by CONTRACTOR whether at the site or in his principal or a branch office for general administration of the Work and not specifically included in the schedule referred to in paragraph 11.4.1 - all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

11.5.2. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the work and charges against CONTRACTOR for delinquent payments.

11.5.3. Cost of premiums for all Bonds and for all insurance policies whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except as otherwise provided in paragraph 11.4.5.10).

11.5.4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.

11.5.5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

11.5.6. The OWNER will not honor any request or demand for additional reimbursement based on escalated material costs.

11.6. CONTRACTOR's Fee - The CONTRACTOR's Fee which shall be allowed to CONTRACTOR for his overhead and profit shall be determined as follows:

11.6.1. a mutually acceptable fixed fee; or if none can be agreed upon, a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.1.1. for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's fee shall be ten percent,

11.6.1.2. for costs incurred under paragraph 11.4.3, the CONTRACTOR's Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall be ten percent, and

11.6.1.3. no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5, and 11.5.

11.7. The amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost, will be the amount of the actual net decrease. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase, if any.

11.8. Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will submit in form prescribed by Engineer an itemized cost breakdown together with supporting data.

11.9. **Cash Allowances** - It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such materialmen, suppliers, or Subcontractors and for such sums within the limit of the allowances as OWNER may approve.

Upon final payment, the Contract Price shall be adjusted as required and an appropriate Change Order issued. CONTRACTOR agrees that the original Contract Price includes such sums as he deems proper for costs and profit on account of cash allowances. No demand for additional cost or profit in connection therewith will be allowed.

SECTION 12 - CHANGE OF THE CONTRACT TIME

12.1. The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to OWNER within fifteen (15) days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five (45) days of such occurrence unless OWNER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the Contract Time shall be determined by OWNER. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

12.2. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if he makes a claim therefor as provided in paragraph 12.1. Such delays shall include, but not be restricted to, acts or neglect by any separate contractor employed by OWNER, fires, floods, labor disputes, epidemics, abnormal weather conditions, or Force Majeure.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement.

12.4. Other than a change in the Contract Time, no compensation, adjustment or change in the Contract Price will be paid to the CONTRACTOR for any hindrance or delay, whether avoidable or unavoidable, foreseeable or unforeseeable.

SECTION 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.1. **Warranty and Guarantee.** CONTRACTOR warrants and guarantees to OWNER and Engineer that all materials and equipment will be new unless otherwise specified and that all Work will be of good quality and free from faults or defects for a period of one (1) year following its completion and acceptance. All unsatisfactory Work, all faulty or defective Work, and all Work not conforming to the requirements of the Contract Documents at the time of acceptance thereof or of such inspections, tests, or approvals, shall be considered defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, whether or not in place, may be rejected, corrected, or accepted as provided in this Section 13.

13.2. Tests and Inspections.

The number, type and location of tests shall be determined by the Engineer. The costs of all tests, except as provided below, shall be paid for by the OWNER. The costs of the following shall be paid by the CONTRACTOR at no cost to the OWNER:

13.2.1. Retests due to failure to pass the initial test or due to the fault of CONTRACTOR.

13.2.2. Tests of all materials or manufactured items, not furnished by the OWNER, which will be incorporated into the work to insure compliance with the applicable specification. Testing and mix designs shall be made by a Laboratory. The CONTRACTOR shall furnish the OWNER four (4) copies of all test reports, including job-mix formula, of all material incorporated into the work and distribute them per the OWNER'S requirements. The Laboratory shall note the OWNER on all reports as "client". Design mix and materials test and certifications shall be included in the related pay items.

13.3. CONTRACTOR shall give OWNER timely notice of readiness of the Work for all inspections, tests, or approvals. If any such Work required to be inspected, tested, or approved is covered without written approval of OWNER, it must, if requested by OWNER, be uncovered for observation; and such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given OWNER timely notice of his intention to cover such Work and OWNER has not acted with reasonable promptness in response to such notice.

13.4. Neither observations by OWNER nor inspections, tests, or approvals by persons other than CONTRACTOR shall relieve CONTRACTOR from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

13.5. **Access to Work.** OWNER and his representatives will, at reasonable times, have access to the Work. CONTRACTOR shall provide proper and safe facilities for such access and observation of the Work and also for any inspection or testing thereof by others.

13.6. **Uncovering Work.** If any Work is covered contrary to the written request of OWNER, it must, if requested by OWNER, be uncovered for his observation and recovered at CONTRACTOR'S expense.

13.7. If any Work has been covered which OWNER has not specifically requested to observe prior to its being covered or if OWNER considers it necessary or advisable that covered Work be inspected or tested by others, CONTRACTOR, at OWNER'S request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as OWNER may require that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including compensation for additional professional services and an appropriate deductive Change Order shall be issued. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time or both, directly attributable to such

uncovering, exposure, observation, inspection, testing, and reconstruction if he makes a claim therefor as provided in Sections 11 and 12.

13.8. Owner May Stop the Work. If the work is defective or CONTRACTOR fails to supply sufficient skilled workmen or suitable materials or equipment or if CONTRACTOR fails to make prompt payments to Subcontractors or for labor, materials, or equipment, OWNER may order CONTRACTOR to stop the work or any portion thereof until the cause for such order has been eliminated; however, this right of OWNER to stop the work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

13.9. Correction or Removal of Defective Work. If required by OWNER prior to approval of final payment, CONTRACTOR shall promptly, without cost to OWNER and as specified by OWNER, either correct any defective Work, whether or not fabricated, installed, or completed or, if the Work has been rejected by OWNER, remove it from the site and replace it with nondefective Work. If CONTRACTOR does not correct such defective Work or remove and replace such rejected Work within a reasonable time, all as specified in a written notice from OWNER, OWNER may have the deficiency corrected or the rejected Work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR and an appropriate deductive Change Order shall be issued. CONTRACTOR shall also bear the expenses of making good all Work of others destroyed or damaged by his correction, removal, or replacement of his defective Work.

13.10. One (1) Year Correction Period. If, after the approval of final payment and prior to the expiration of one (1) year after the date of acceptance of final payment or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instruction, either correct such defective Work or, if it has been rejected by OWNER, remove it from the site and replace it with nondefective work. If CONTRACTOR does not promptly comply with the terms of such instructions, OWNER may have the defective work corrected or the rejected work removed and replaced. All direct and indirect cost of such removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR.

13.11. Acceptance of Defective Work. If, instead of requiring correction or removal and replacement of defective Work, OWNER prefers to accept it, OWNER may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or, if the acceptance occurs after approval of final payment, an appropriate amount shall be paid by CONTRACTOR to OWNER.

13.12. Neglected Work by CONTRACTOR. If CONTRACTOR fails to prosecute the Work in accordance with the Contract Documents, including any requirements of the progress schedule, OWNER, after seven (7) days written notice to CONTRACTOR may, without prejudice to any other remedy he may have, make good such deficiencies and the cost thereof (including compensation for additional professional services) shall be charged against CONTRACTOR if OWNER approves such action, in which case a Change Order shall be issued incorporating the necessary revisions in the Contract Documents including an appropriate reduction in the Contract Price. If the payments then or thereafter due CONTRACTOR are not sufficient to cover such amount, CONTRACTOR shall pay the difference to OWNER.

SECTION 14 - PAYMENTS AND COMPLETION

14.1. Schedules. At least ten (10) days prior to submitting the first Application for Progress or Partial Payment ("Application"), CONTRACTOR shall submit a progress schedule, a final schedule of Shop Drawing submission, a critical path method schedule, and a

schedule of values of the Work. These schedules shall be satisfactory in form and substance to OWNER. The schedule of values shall include quantities and unit prices aggregating the Contract Price and shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon approval of the schedules of values by Owner and/or Engineer, it shall be incorporated into the form of Application for Payment furnished by OWNER.

14.1.1. Application for Progress or Partial Payment. At least ten (10) days before the date for each progress payment, the CONTRACTOR shall submit to the Owner or Engineer an Application for Payment, supported by such data substantiating the CONTRACTOR's right to payment as the Engineer or OWNER may require. The Owner or Engineer shall, pursuant to paragraph 14.3, make a determination as to whether or not said application is properly payable based upon his determination and estimate of the value of the Work done and the materials delivered and stored at the site for the Work during the previous payment period. After the OWNER or Engineer has completed his evaluation and the Application for Payment has been approved by the OWNER, the OWNER will make payment to the CONTRACTOR in accordance with paragraph 14.1.2 below. Payment by the OWNER to the CONTRACTOR may be made by first-class mailing, electronic funds transfer or by hand delivery of the undisputed amount of a pay request based on work completed under the Contract.

14.1.2 In compliance with the New Mexico Retainage Act, NMSA 1978 § 57-28-1 *et seq* (2001) (aka Prompt Payment Act) as amended from time-to-time, retainage shall not be withheld on any construction contract within New Mexico.

If OWNER does not dispute or question CONTRACTOR's Application for Progress or Partial Payment, then OWNER shall pay CONTRACTOR the full amount within twenty-one (21) calendar days of receipt of the undisputed amount and if OWNER fails to do so, then OWNER shall pay CONTRACTOR interest, as required by the New Mexico Retainage Act, from the twenty-second (22nd) calendar day after said receipt at the rates set forth from time-to-time in the Retainage Act (currently set at one and one-half percent (1.5%) of the undisputed amount per month, or fraction of a month) until the payment is issued. Nothing in this Contract shall be construed as requiring OWNER to pay interest on disputed amounts or on CONTRACTOR claims.

CONTRACTOR and all Subcontractors shall make prompt payment, within seven (7) calendar days after receipt of payment from OWNER or CONTRACTOR, to their respective Subcontractors and suppliers for amounts owed for material or services performed for the Work. If CONTRACTOR or any Subcontractor fails to make such prompt payment, then CONTRACTOR and Subcontractor shall pay interest on such amounts at the rate and for the time period specified from time-to-time in the Retainage Act.

If the OWNER shall at any time fail to make a monthly payment at the time specified herein, such failure shall not be held to violate or void this Contract.

14.1.3. Upon request the CONTRACTOR shall file with the OWNER a receipt in full from each manufacturer, Subcontractor and dealer for all equipment and material used on the Work and a complete release on all Liens which may have arisen from this Contract.

14.1.4. Materials shall be stored either at the CONTRACTOR's storage area or at the construction site.

14.2. CONTRACTOR's Warranty of Title. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER at the time of payment free and clear of all Liens.

14.3. Approval of Payments. OWNER and/or Engineer will, within ten (10) calendar days after receipt of each Application for Payment, indicate in writing his approval of payment or will return the Application to CONTRACTOR indicating in writing his reasons for refusing to

approve payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. OWNER shall, upon presentation to him of an approved Application for Payment, pay CONTRACTOR the amount approved by OWNER and/or Engineer in accordance with paragraph 14.1.2 above.

14.4. OWNER's or Engineer's approval of any payment requested in an Application for Payment will be based on on-site observations of the Work in progress and on review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents and any qualifications stated in his approval); and that CONTRACTOR is entitled to payment of the amount approved. However, by approving any such payment, OWNER or Engineer will not thereby be deemed to have represented that he made exhaustive or continuous on-site inspections to check the quality or the quantity of the Work or that he has reviewed the means, methods, techniques, sequences, and procedures of construction or that he has made any examination to ascertain how or for what purpose CONTRACTOR has used the monies paid or to be paid to him on account of the Contract Price or that title to any Work, materials, or equipment has passed to OWNER free and clear of any Liens.

14.5. OWNER's approval of final payment will constitute an additional representation that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.12 have been fulfilled.

14.6. OWNER or Engineer may refuse to approve the whole or any part of any payment if, in his opinion, it would be incorrect to make such representations. OWNER or Engineer may also refuse to approve any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously approved, to such extent as may be necessary in his opinion to protect OWNER from loss because:

14.6.1. the Work is defective or completed Work has been damaged, requiring correction or replacement;

14.6.2. the CONTRACTOR has failed to comply with barricading requirements.

14.6.3. claims or Liens have been filed or there is reasonable cause to believe such may be filed;

14.6.4. the Contract Price has been reduced because of Modifications;

14.6.5. OWNER has been required to correct defective work or complete the work in accordance with paragraph 13.11; or

14.6.6. of unsatisfactory prosecution of the work, including failure to furnish acceptable submittals or to clean up.

14.7. Substantial Completion. Prior to final payment, CONTRACTOR may, in writing to OWNER, certify that the entire Project is substantially complete and request that a certificate of Substantial Completion be issued. Within a reasonable time thereafter, OWNER and CONTRACTOR shall make an inspection of the Project to determine the status of completion. If OWNER does not consider the Project substantially complete, the CONTRACTOR will be so notified in writing, giving reasons therefor. After CONTRACTOR has completed/corrected Work he shall again notify OWNER in writing, requesting a certificate of Substantial Completion. If owner feels the Project is substantially complete, OWNER will issue a Certificate of Substantial Completion which shall fix the date of Substantial Completion and the responsibilities between OWNER and CONTRACTOR regarding maintenance, heat, and utilities.

14.7.1 CONTRACTOR shall bear the risk of loss and damage with respect to the WORK at the site, as well as all OWNER furnished
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property and all materials and equipment in temporary storage both on and off the site, until the date of Substantial Completion.

14.8. OWNER shall have the right to exclude CONTRACTOR from the Project after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list (punchlist items).

14.9. Partial Utilization. Prior to final payment, OWNER may request CONTRACTOR in writing to permit OWNER to use a specified part of the Project which he believes he may use without significant interference with construction of the other parts of the Project. If CONTRACTOR agrees, he will certify to OWNER that said part of the Project is substantially complete and request an issue of certificate of Substantial Completion for that part of the Project. Within a reasonable time thereafter OWNER and CONTRACTOR shall make an inspection of that part of the Project to determine its status of completion. If OWNER does not consider that it is substantially complete, he will notify CONTRACTOR in writing giving his reasons therefor. If OWNER considers that part of the Project to be substantially complete, he will execute and deliver to CONTRACTOR a certificate to that effect, fixing the date of Substantial Completion and beginning of Warranty period if applicable as to that part of the Project, attaching thereto a tentative list of items to be completed or corrected before final payment and fixing the responsibility between OWNER and CONTRACTOR for maintenance, heat, and utilities as to that part of the Project. OWNER shall have the right to exclude CONTRACTOR from any part of the Project which has been certified to be substantially complete; but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list (punch list items). The issuance of such a certificate shall not operate to release the CONTRACTOR or his sureties from any obligation under this Contract or the performance bond.

14.10. Final Inspection. Upon written notice from CONTRACTOR that the Project is complete, OWNER and/or Engineer will make a final inspection with CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies (including tentative or punch list items previously identified).

14.11. Final Application for Payment. After CONTRACTOR has completed all such corrections to the satisfaction of OWNER and delivered all maintenance and operating instruction, schedules, guarantees, Bonds, certificates of inspection, as-built Plans and other documents - all as required by the Contract Documents - he may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by such data and schedules as OWNER may reasonably require, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of the Contract Documents and the labor and services performed and the material and equipment furnished. Alternately, and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material, and equipment for which a lien could be filed, and that all payrolls, material, and equipment bills, and other indebtedness connected with the work for which OWNER or his property might in any way be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment. If any Subcontractor, materialman, fabricator, or supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a bond or other collateral satisfactory to OWNER to indemnify him against any lien.

14.12. Approval of Final Payment. If, on the basis of his observation and review of the Work during construction, his final inspection, and his review of the final Application for Payment - all as required by the Contract Documents - OWNER and/or Engineer is satisfied that the Work has been completed and CONTRACTOR has fulfilled all of his obligations under the Contract Documents, he will, within ten (10) days after receipt of the final Application for Payment, indicate in writing his approval of payment and present the Application to OWNER for payment. OWNER will then give written notice to CONTRACTOR that the Work is acceptable subject to the provisions of

paragraph 14.15. Otherwise, he will return the Application to CONTRACTOR, indicating in writing his reasons for refusing to approve final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. OWNER shall pay CONTRACTOR the amount approved.

14.13. After Substantial Completion of the Work, if final completion thereof is materially delayed through no fault of CONTRACTOR, OWNER shall, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted in accordance with paragraph 14.1.2 above. If the remaining balance for Work not fully completed or corrected is less than the amounts covered by Bonds which have been furnished as required in paragraph 5.1, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the OWNER prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

14.14. CONTRACTOR'S Continuing Obligation. CONTRACTOR's obligation to perform the Work and complete the Project in accordance with the Contract Documents shall be absolute. Neither approval of any progress or final payment by OWNER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Project or any part thereof by OWNER, nor any act of acceptance by OWNER, nor any failure to do so, nor any correction of defective work by OWNER shall constitute an acceptance of Work not in accordance with the Contract Documents.

14.15. Waiver of Claims. The making and acceptance of final payment shall constitute:

14.15.1. a waiver of all claims by OWNER against CONTRACTOR other than those arising from unsettled Liens, from defective work appearing after final inspection pursuant to paragraph 14.10 or from failure to comply with the requirements of the Contract Documents or the terms of any special guarantees specified therein, and

14.15.2. a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

14.16. Liquidated Damages. If CONTRACTOR shall neglect, fail or refuse to complete the Work within the time specified, or any proper extension thereof, granted by the OWNER, then the CONTRACTOR agrees, as a part consideration for the awarding of this Contract, to pay to the OWNER the amount specified in the Invitation to Bid - Construction Contract, not as a penalty but as liquidated damages for such breach of contract, for each and every Calendar Day that the CONTRACTOR shall be in default after the time stipulated in the Contract for completing the Work.

14.17. General. If the OWNER fails to pay the CONTRACTOR within twenty-one (21) calendar days after receipt of an undisputed Application for Progress or Final Payment, the OWNER shall pay an interest penalty to the CONTRACTOR in accordance with paragraph 14.1.2 above. In addition, the CONTRACTOR and Subcontractors shall make prompt payment to their Subcontractors and suppliers for amounts due and owing in accordance with paragraph 14.1.2. These payment provisions apply to all tiers of CONTRACTORS, Subcontractors, and suppliers.

SECTION 15 - SUSPENSION OF WORK AND TERMINATION

15.1. Owner May Suspend Work. OWNER may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by notice in writing to CONTRACTOR and Engineer which shall fix the date on which work shall be resumed, CONTRACTOR will be allowed an extension of the contract time directly attributable to any suspension if he makes a claim as provided in Section 12.

15.2. Owner May Terminate. If CONTRACTOR repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, CC-17

or if he repeatedly fails to make prompt payments to Subcontractors or for labor, materials, or equipment, or if he disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction, or if he disregards the authority of OWNER, or if he otherwise violates any provision of the Contract Documents, then OWNER may, without prejudice to any other right or remedy and after giving CONTRACTOR and his Surety seven (7) days written notice, terminate the services of CONTRACTOR and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereof owned by CONTRACTOR and finish the Work by whatever method he may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER shall be incorporated in a Change Order.

15.3. Where CONTRACTOR's services have been so terminated by OWNER, this termination shall not affect any rights of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by OWNER due CONTRACTOR will not release CONTRACTOR from liability.

15.4. Upon seven (7) days written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Project and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus a reasonable profit.

15.5. CONTRACTOR May Stop Work or Terminate. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety (90) days by OWNER or under an order of court or other public authority, or OWNER fails to act on any Application for Payment within thirty (30) days after it is submitted, or OWNER fails to pay CONTRACTOR any sum approved or awarded by arbitrators within thirty (30) days of its approval and presentation, then CONTRACTOR may, upon seven (7) days written notice to OWNER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus a reasonable profit. In addition and in lieu of terminating the Agreement, if OWNER has failed to act on an Application for Payment or OWNER has failed to make any payment as required, CONTRACTOR may, upon seven (7) days written notice to OWNER, stop the Work until he has been paid all amounts then due.

SECTION 16 – DISPUTE RESOLUTION

16.1. Prior to instituting arbitration, or other legal proceedings, the parties shall first meet, confer, and attempt to negotiate a resolution of any claim or dispute related to or arising out of this Agreement. For CONTRACTOR Claims, this negotiation session shall occur within thirty (30) days after OWNER receives written notice of a claim, together with the supporting data as required by Section 11.2. For OWNER Claims, the negotiation session shall occur within thirty (30) days after the OWNER gives written notice to the CONTRACTOR of the nature of the claim or dispute, together with a request for a negotiation session.

16.2. If the claim of dispute is not resolved by the negotiation session, then the matter will be submitted to mediation, pursuant to the New Mexico Public Works Mediation Act, § 13-4C-1, NMSA (1997 Repl.) as amended, to the date of execution of this Contract Document.

Notice of the mediation shall be sent within thirty (30) days after the date of the negotiation session.

16.3. If the claim or dispute is not resolved through mediation, and if the aggregate amount of the claims between OWNER and CONTRACTOR does not exceed two hundred fifty thousand dollars (\$250,000), then the claim or dispute arising out of or relating to this Contract Document shall be submitted to binding arbitration pursuant to the New Mexico Uniform Arbitration Act, § 44-7A-1, *et. seq.*, NMSA (2001). This Contract Document to Arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by

the arbitrator shall be final and judgment may be entered upon it in any Court having jurisdiction thereof. A written demand for arbitration, describing the nature of the claim, shall be made within thirty (30) days after the date of the mediation. In no event shall the demand for arbitration be made after the institution of legal or equitable proceedings based on any such claim would be barred by the applicable statute of limitations. CONTRACTOR will carry on the work and maintain the progress schedule during any dispute resolution proceedings, unless otherwise agreed to by the OWNER and CONTRACTOR in writing.

16.4 If the claim or dispute is not resolved through mediation, and if the aggregate amount of the claims between the OWNER and CONTRACTOR exceeds two hundred fifty thousand dollars (\$250,000), then the claim or dispute between the OWNER and CONTRACTOR shall be decided by the District Court, San Juan County, New Mexico, and shall be subject to all applicable appeals.

SECTION 17 - MISCELLANEOUS

17.1. Giving Notice. Whenever any provision of the Contract Documents requires the giving of written notice it shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended or sent by mail, postage prepaid, to the last business address known to him who gives the notice.

17.2. Computation of Time. When any period of time is referred to in the Contract Documents by days, it shall be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a Legal Holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

17.3. All Specifications, Drawings, and copies thereof furnished by OWNER shall remain his property. They shall not be used by CONTRACTOR on another Project and, with the exception of those sets which have been signed in connection with the execution of the Agreement, shall be returned to OWNER on request upon completion of the Project.

17.4. The duties and obligations imposed by these Contract Conditions and the rights and remedies available hereunder and, in particular but without limitation, the warranties, guarantees, and obligations imposed upon CONTRACTOR by paragraphs 6.29, 13.1, 13.10 and 14.2 and the rights and remedies available to OWNER thereunder shall be in addition to and shall not be construed in any way as a limitation of any rights and remedies available to them which are otherwise imposed or available by law, by special guarantee or by other provisions of the Contract Documents.

17.5. Should OWNER or CONTRACTOR suffer injury or damage to his person or property because of any error, omission, or act of the other or of any of his employees or agents or others for whose acts he is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage.

17.6. The Contract Documents shall be governed by the law of the state of New Mexico.

17.7. Minimum Wages (Federal). In the event that any work under this contract involved Federal Funds, then the prevailing area Wage Rate Decision listed by the U.S. Department of Labor shall be made a part of this contract. Whenever a conflict exists between the State and Federal Minimum Hourly Wage Rates, the higher of the conflicting wage rates shall govern.

17.8. Archaeological Salvage and Reports. Where objects of historical, archaeological, and paleontological value, including ruins, sites, buildings, artifacts, fossils, and other objects of antiquity are encountered within the areas on which the CONTRACTOR's operations are performed, the CONTRACTOR shall postpone operations in the area, shall preserve such objects from disturbance or damage, and shall immediately notify the OWNER of their existence and location.

Upon receipt of such notification, the OWNER will arrange for the disposition of the objects or for the recording of data relative thereto and will notify the CONTRACTOR when it is proper for him to proceed with the Work in the affected area. In this regard, the OWNER may consult the Museum of New Mexico or other appropriate agency as to the nature and disposition of such objects. If the CONTRACTOR is directed by the Engineer to perform any work in salvaging said objects, the CONTRACTOR shall do so in accordance with the "Changes in the Work" provision of Section 10.

17.9. Measurement of Quantities for Unit Price Work. Unless otherwise specified, linear or area quantities of work such as grading, landscaping, paving, curb, gutter, walk, and other work of a similar nature shall be determined from measurements or dimensions of such work and computed in horizontal planes. However, linear quantities of underground cable, fencing piling, and timber shall be considered as being the true length measured along the longitudinal axis thereof. For pipe work, see appropriate sections of the City of Farmington Technical Specifications and Construction Standards; but if the method of measurement for pipe work is not stated therein, it shall be measured along the longitudinal axis of the pipe in place from center of manhole to center of manhole. A station when used as a definition or term of measurement will be 100 linear feet measured horizontally.

Volumetric quantities shall be determined by the average end area method.

17.10. Method of Measurement. Materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the method stipulated in the particular sections herein covering materials or types of work. When material is to be paid for on a volume basis and it would be impracticable to determine volume by the specified method of measurement or when requested by the CONTRACTOR and approved by the OWNER, the material will be weighted in accordance with the requirements specified for weight measurement and such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the OWNER and shall be agreed to by the CONTRACTOR before such method of measurement of pay quantities will be adopted.

Unless otherwise provided, when mineral aggregate or Roadway material is being paid for by weight, deductions from pay quantities will be made for the weight of water in excess of 3% if the material is to be treated with bitumen and 6% if the material is to be waterbound.

17.11. Certified Weights. All materials to be paid for at a contract unit price per ton shall be weighed on platform scales furnished by the CONTRACTOR or his supplier of materials at the CONTRACTOR's expense, or such materials may be weighed on certified public scales at the CONTRACTOR's expense. All scales shall be of adequate size to permit the entire vehicle to rest on the scale platform while being weighed. Scales furnished by the CONTRACTOR shall be installed on beams, piers, or foundations of sufficient strength and bearing to prevent the weighing mechanism supporting the scale platform from settling. The weighing facilities shall include a weatherproof scale house with a minimum floor area of thirty-two (32) square feet and equipped with adequate heat and light.

17.12. Compliance with Affirmative Action Plan. The CONTRACTOR shall include and follow the provisions of the Affirmative Action Program of the City of Farmington as adopted annually by the Farmington City Council, the terms of such Affirmative Action Plan being incorporated herein and made a part hereof by reference.

17.13. Compliance with other Applicable Federal Requirement. CONTRACTOR will comply with all applicable Federal requirements which may be encountered or connected with this Project.

17.14. Compliance with Copeland Anti-Kickback Act and Regulations. The CONTRACTOR shall comply with the Copeland Anti-Kickback Act and Regulations of the Secretary of Labor (29 CFR, Part 3) which are incorporated into this Contract.

17.15. Compliance with Safety Standards. CONTRACTOR will comply with the safety standards provisions of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" latest revision published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 Public Law 91-596, and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No. 75 Saturday, April 17, 1971 together with any amendments or modifications to any of the foregoing which are applicable to CONTRACTOR's performance of this Contract.

SECTION 18 - SPECIAL NOTICE TO CONTRACTOR - STATE OF NEW MEXICO LABOR AND INDUSTRIAL DIVISION

18.1. Minimum Wages. The CONTRACTOR and any Subcontractor performing work under this contract shall comply fully with the "Public Works Minimum Wage Act" Section 13-4-11 through 13-4-17, NMSA 1978 and all amendments thereto, which provides in part that "the contractor, subcontractor, employer or any person acting as a contractor shall pay all mechanics and laborers employed on the site of the project, unconditionally and not less often than once a week, and without subsequent unlawful deduction or rebate on any account, the full amounts accrued at time of payment computed at wage rates not less than those stated in the minimum wage rates issued for the project."

The CONTRACTOR, Subcontractor, employer or any person acting as a CONTRACTOR shall pay each of his employees working under this contract in full, in cash, and not less than once a week, less all legally required deductions or withholding. When circumstances are such that payment in cash is not feasible or is impractical, payment may be made by check, provided however, that adequate funds to cover same are on deposit at the bank upon which the checks are drawn, and further that the checks may be cashed without charge, trade requirements or undue inconvenience to the payee.

The minimum hourly rate of wage which may be paid to workmen in each trade or occupation required for the Work under the Contract employed in the performance of the Contract either by the CONTRACTOR, Subcontractor, employer or any person acting as a CONTRACTOR shall be as set forth in the schedule of minimum wage rates appearing in these Contract Documents, and the workmen employed in the performance of the Contract shall be paid not less than the applicable specified minimum hourly rate of wage as such is set forth in said schedule.

The scale of wages to be paid shall be posted by the CONTRACTOR or person acting as a CONTRACTOR in a prominent and easily accessible place at the Worksite; and it is further provided that there may be withheld from the CONTRACTOR, Subcontractor, employer or any person acting as a CONTRACTOR so much of accrued payments as may be considered necessary by the OWNER to pay to laborers and mechanics employed on the Project the difference between the rates of wages required by the Director of the Labor and Industrial Division of the Labor Department to be paid to laborers and mechanics on the work and the rates of wages received by such laborers and mechanics and not refunded to the CONTRACTOR, Subcontractors, employer or any person acting as a CONTRACTOR or their agents

18.1.1. The attention of the CONTRACTOR and any Subcontractor performing work under this Contract is directed to Section 13-4-12, NMSA 1978 which reads in part as follows:

A. As used in Section 13-4-11 NMSA 1978 'wages', 'scale of wages', 'wage rates', 'minimum wages', and 'prevailing wages' include:

1) The basic hourly rate of pay, and

2) The amount of:

(a) the rate of contribution irrevocably made by a contractor, subcontractor, employer or any person acting as a contractor to a trustee or a third person pursuant to a fund, plan or program; and

(b) the rate of costs to a contractor, subcontractor, employer or any person acting as a contractor which reasonable may be anticipated in providing benefits to laborers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the laborers and mechanics affected for: 1) medical or hospital care; 2) pensions on retirement or death; 3) compensation for injuries or illness resulting from occupational activity; or 4) insurance to provide for any of the foregoing; and for: 5) unemployment benefits; 6) life insurance; 7) disability and sickness insurance; 8) accident insurance; 9) vacation and holiday pay; 10) costs of apprenticeship or other similar programs; or for 11) other bona fide fringe benefits; but only where the contractor, subcontractor, employer or person acting as a contractor is not required by other federal, state, or local law to provide any of the foregoing or similar benefits.

B. The obligation of a contractor, subcontractor, employer or person acting as a contractor to make payment in accordance with the prevailing wage determinations of the director of the labor and industrial division of the labor department, insofar as Section 13-4-11 NMSA 1978 or other sections of legislative acts incorporating Section 13-4-11 NMSA 1978 are concerned, may be discharged by:

(1) the making of payments in cash;

(2) the making of contributions of a type referred to in Subparagraph (a) of Paragraph (2) of Subsection A of this section; or

(3) the assumption of an enforceable commitment to bear the costs of a plan or program of a type referred to in Subparagraph (b) of Paragraph (2) of Subsection A of this section or any combination thereof where the aggregate of any payments or contributions and costs therefor is not less than the rate of pay described in Section 13-4-11 NMSA 1978 plus the amount referred to in this section."

18.1.2. In the event it is found by the Director of the Labor and Industrial Division of the Labor Department that any laborer or mechanic employed by the CONTRACTOR or Subcontractor on the site of the Project covered by the Contract has been or is being paid as a result of a willful violation of a rate of wages less than the rate of wages required by the Contract, the OWNER may, by written notice to the CONTRACTOR, Subcontractor, employer or person acting as a CONTRACTOR terminate their right to proceed with the work or such part of the Work as to which there has been a willful failure to pay the required wages, and the OWNER may prosecute the Work to completion by contract or otherwise, and the CONTRACTOR or person acting as a CONTRACTOR and his sureties shall be liable to the OWNER for any excess costs occasioned thereby. Any party receiving notice of termination of his Contract or subcontract under the provisions of this section may appeal the finding of the Director of the Labor and Industrial Division as provided in the Public Works Minimum Wage Act.

18.1.3. There is no representation on the part of the OWNER that labor can be obtained at the hourly rates shown in these Contract Documents. It is the responsibility of Bidders to inform themselves as to local labor conditions and prospective changes or adjustments of wage rates. No increase in the Contract Price shall be allowed or authorized on account of the payment of wage rates in excess of those listed.

18.1.4. Payrolls and basic records relating thereto will be maintained during the course of the Work and preserved for a period of three (3) years thereafter for all laborers and mechanics working at the site of the Work.

18.1.5 The CONTRACTOR will submit one complete, legible, certified weekly payroll record to the Labor and Industrial Division. One copy shall be sent to the OWNER. Both copies must be mailed not more than five working days following the close of the second payroll period. Weekly payrolls may be submitted bi-weekly. The copy shall be accompanied by a statement signed by the employer or his agent indicating that the payrolls are correct and complete, that the wage rates

contained therein are not less than those determined by the Labor and Industrial Division and that the Classifications set forth for each laborer or mechanic conform with the work he performed. The prime CONTRACTOR shall be responsible for submitting copies of payrolls of all Subcontractors. The CONTRACTOR shall make the records required under the labor standards clauses of the contract available for inspection by authorized representatives of the State and Federal Government and the Labor and Industrial Division and shall permit such representatives to interview employees during working hours on the job.

18.1.5.1. Form and Content: Weekly payrolls are required from the CONTRACTOR and/or Subcontractor and shall include the payroll clerk's phone number and all of the following information:

(1) The employee's full name, address, and social security number.

(a) The employee's full name and social security number need only appear on the first payroll on which his/her name appears.

(b) The employee's address need be shown only on the first submitted payroll on which his/her name appears, unless a change of address necessitates an additional submittal to reflect the new address.

(2) The employee's classification (or classifications).

(3) The employee's hourly wage rate (or rates); the employee's hourly fringe benefits; and, where applicable, his overtime hourly wage rate (or rates).

(4) The daily and weekly hours worked in each classification, including actual overtime hours worked (not adjusted).

(5) The itemized deductions made.

(6) The net wages paid.

(7) The number of the project wage rate decision (from top right of decision), including the county.

18.1.5.2. Numbering Payrolls: All payrolls shall be numbered starting with number one (1) for the first payroll at the beginning of the job and continuing in numerical order (including weeks of no work) until the job is completed with the last payrolls marked final.

18.1.5.3. Any apprentices, pre-apprentices, or trainees employed on the Project must be duly registered in a bona fide apprenticeship program registered with the State Apprenticeship Council or recognized by the Bureau of Apprenticeship and Training, U.S. Department of Labor. Certification showing registration status of apprentices, pre-apprentices, or trainees must accompany the first full payroll on which each apprentice, pre-apprentice, or trainee appears. There must be a least one journeyman on the Worksite in the same job classification for each apprentice during the hours worked by the apprentice.

18.1.5.4. Certification of Payrolls: The CONTRACTOR and each of his Subcontractors shall submit a weekly statement of compliance in the form required by the Labor and Industrial Division.

18.2. Apprenticeship and Training: The CONTRACTOR shall make contributions to approved apprentice and training programs in New Mexico in which the CONTRACTOR is a participant or to the Public Works Apprentice and Training Fund administered by the Public Works Bureau, Labor and Industrial Division, New Mexico Department of Labor, pursuant to the Public Works Apprenticeship and Training Act, Section 13-4D-1 through 13-4D-8 NMSA 1978. The minimum wage rates, if any, specified for apprentices shall apply only to persons working with the tools of the trade that they are learning, and under the direct supervision of the journeyman or master mechanics. Except as otherwise required by law, the number of apprentices in each trade or occupation employed by the CONTRACTOR or any Subcontractor shall

CC-20

not exceed the number permitted by the applicable standard of the United States Department of Labor, or in the absence of such standards, the number permitted under the usual practice prevailing between trade unions and Employers Association of the respective trades or occupations.

18.3. Extra Work - Minimum Wage: In case the OWNER orders the CONTRACTOR to perform Extra Work or additional Work which may make it necessary for the CONTRACTOR or any Subcontractor under him to employ in the performance of such work, any person in any trade or occupation for which no minimum wage rate is specified, the CONTRACTOR shall notify the OWNER of the job classification. The OWNER may make a written request for such classification to the Director, Labor and Industrial Division. If approved, an addendum will be issued. If a rate is not requested or not approved, the free market shall determine the rate paid.

18.4. Wage Underpayments and Adjustments: The CONTRACTOR agrees that, in case of underpayment of wages to any worker on the Project under this Contract, the OWNER may withhold out of payments due an amount sufficient to pay such worker the difference between the wages required to be paid under this contract and the wages actually paid such worker for the total number of hours worked and that the OWNER may disburse such amount so withheld by it for and on account of the CONTRACTOR to the employee to which such amount is due. The CONTRACTOR further agrees that the amounts to be withheld pursuant to this paragraph may be in addition to the percentages to be retained by the OWNER pursuant to other provisions of this contract.

A copy of the Labor and Industrial Division minimum wage rates and in effect at the time of the Contract shall be posted in a prominent and easily accessible place at the Worksite or otherwise made available to the CONTRACTOR's employees at all times on the job.

SECTION 19 - NEW MEXICO STATUTES RELATING TO UNLAWFUL DISCRIMINATORY PRACTICE (28-1-1 TO 28-1-15 NMSA 1978) - 28-1-7 NMSA 1978. Unlawful discriminatory practice.

It is an unlawful discriminatory practice for:

19.1. an employer, unless based on a bona fide occupational qualification, to refuse to hire, to discharge, to promote or demote or to discriminate in matters of compensation terms, conditions or privileges of employment against any person otherwise qualified because of race, age, religion, color, national origin, ancestry, sex or physical or mental handicap; provided, however, that 29 U.S.C. Section 631 (c) (1) and (2) shall apply to discrimination based on age;

19.2. a labor organization to exclude an individual or to expel or otherwise discriminate against any of its members or against any employer or employee because of race, religion, color, national origin, ancestry, sex or physical or mental handicap;

19.3. any employer, labor organization or joint apprenticeship committee to refuse to admit or employ any individual in any program established to provide an apprenticeship or other training or retraining because of race, religion, color, national origin, ancestry, sex or physical or mental handicap;

19.4. any person, employer, employment agency or labor organization to print or circulate or cause to be printed or circulated any statement, advertisement or publication, to use any form of application for employment or membership or to make any inquiry regarding prospective membership or employment which expresses, directly or indirectly, any limitation, specification or discrimination as to race, color, religion, national origin, ancestry, sex or physical or mental handicap unless based on a bona fide occupational qualification;

19.5. an employment agency to refuse to list and properly classify for employment or refer an individual for employment in a known available job for which the individual is otherwise qualified because of race, religion, color, national origin, ancestry, sex or physical or mental handicap unless based on a bona fide occupational qualification; or to comply with a request from an employer for referral of applicants for

employment if the request indicates either directly or indirectly that the employer discriminates in employment on the basis of race, religion, color, national origin, ancestry, sex or physical or mental handicap unless based on bona fide occupational qualification;

19.6. any person in any public accommodation to make a distinction, directly or indirectly, in offering or refusing to offer its services, facilities, accommodations or goods to any individual because of race, religion, color, national origin, ancestry, sex or physical or mental handicap, provided that the physical or mental handicap is unrelated to an individual's ability to acquire or rent and maintain particular real property or housing accommodations;

19.7. any person to:

19.7.1. refuse to sell, rent, assign, lease or sublease, or offer for sale, rental, lease, assignment or sublease any housing accommodation or real property to any individual, or to refuse to negotiate for the sale, rental, lease, assignment or sublease of any housing accommodation or real property to any individual because of race, religion, color, national origin, ancestry, sex or physical or mental handicap; provided that the physical or mental handicap is unrelated to an individual's ability to acquire or rent and maintain particular real property or housing accommodation; or

19.7.2. discriminate against any individual in the terms, conditions or privileges of the sale, rental, assignment, lease or sublease of any housing accommodation or real property or in the provision of facilities or services in connection therewith because of the race, religion, color, national origin, ancestry, sex or physical or mental handicap, provided that the physical or mental handicap is unrelated to an individual's ability to acquire or rent and maintain particular real property or housing accommodation; or

19.7.3. print, circulate, display or mail or cause to be printed, circulated, displayed or mailed, any statement, advertisement, publication or sign, or use any form of application for the purchase, rental, lease, assignment or sublease of any housing accommodation or real property, or to make any record or inquiry regarding the prospective purchase, rental, lease, assignment or sublease of any housing accommodation or real property, which expresses any preference, limitation or discrimination as to race, religion, color, national origin, ancestry, sex or physical or mental handicap, provided that the physical or mental handicap is unrelated to an individual's ability to acquire or rent and maintain particular real property or housing accommodation;

19.8. any person to whom application is made either for financial assistance for the acquisition, construction, rehabilitation, repair or maintenance of any housing accommodation or real property or for any type of consumer credit including financial assistance for the acquisition of any consumer good, as defined by Section 55-9-109 NMSA 1978, to:

19.8.1. consider the race, religion, color, national origin, ancestry, sex or physical or mental handicap of any individual in the granting, withholding, extending, modifying or renewing, or in the fixing of the rates, terms, conditions or provisions of any financial assistance or in the extension of services in connection with the request for financial assistance; or

19.8.2. use any form of application for financial assistance or to make any record or inquiry in connection with applications for financial assistance which expresses, directly or indirectly, any limitation, specification or discrimination as to race, religion, color, national origin, ancestry, sex or physical or mental handicap;

19.9. any person or employer to:

19.9.1. aid, abet, incite, compel or coerce the doing of any unlawful discriminatory practice, or to attempt to do so; or

19.9.2. engage in any form of threats, reprisal or discrimination against any person who has opposed any unlawful discriminatory practice or has filed a complaint, testified or participated in any

proceeding under the Human Rights Act (Sections 28-1-1 to 28-1-7, 28-1-9 to 28-1-15 NMSA 1978); or

19.9.3. willfully obstruct or prevent any person from complying with the provisions of the Human Rights Act, or to resist, prevent, impede or interfere with the commission or any of its members, staff or representatives in the performance of their duties under the Human Rights Act;

19.10. Any employer to refuse or fail to accommodate to an individual's physical or mental handicap unless such accommodation is unreasonable or an undue hardship.

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V CONTRACT FORMS

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CITY OF FARMINGTON, NEW MEXICO

NOTICE OF AWARD, FORM AF-9

Owner: CITY OF FARMINGTON
800 Municipal Drive
Farmington, NM 87401

Date:

Project: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport

Project #: AIP 3-35-0016-039-2016

Bid #: 17-119587

Contractor:

The Owner has considered the bid submitted by you for the above described work in response to its Advertisement for Bids published TBD, and Instructions to Bidders.

You are hereby notified that your Bid has been accepted for the above described project in the amount shown: _____, plus estimated applicable taxes of _____ (\$ _____ plus estimated applicable taxes of \$ _____).

You are required by the Contract Documents to execute the Agreement and furnish the required Contractor's Performance Bond and Labor, Material and Tax Payment Bond within ten (10) calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said bonds within ten (10) calendar days from the date of this notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner's Central Purchasing Department, to the above address, attention Contracts Administrator.

Owner: CITY OF FARMINGTON

By: _____
Kristi Benson, CPPO, CPPB
Chief Procurement Officer

Date: _____

Contractor: _____

Signature: _____

Printed Name

Title: _____

Date: _____

CITY OF FARMINGTON, NEW MEXICO

AGREEMENT, FORM AF-10

Project Title: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport

Project #: AIP 3-35-0016-039-2016

Bid #: 17-119587

THIS AGREEMENT, made and entered into this _____ day of _____, 2017, by and between the City of Farmington, New Mexico, party of the first part, termed in these Contract Documents as the "Owner" and _____, party of the second part, termed in the Contract Documents as the "Contractor".

WITNESSETH:

WHEREAS, the City Council of the City of Farmington approved the bid of the Contractor on _____ for performance of the work for completion of the Project; and

WHEREAS, pursuant to the Notice of Award, the Contractor has accepted the award and has submitted the required bonds; and,

WHEREAS, in consideration of the sum of _____ plus estimated applicable taxes of _____, (\$ _____ plus estimated applicable taxes of \$ _____) to be paid by the Owner to the Contractor at the time and in the manner hereinafter provided, the said Contractor has agreed, and does hereby agree to furnish labor, tools, equipment, and material, and to construct complete in every detail the following:

Taxiway E, F, and G Reconstruction at Four Corners Regional Airport
PROJECT # AIP 3-35-0016-039-2016
BID # 17-119587

AND FOR SAID CONSIDERATION IT IS AGREED BETWEEN THE PARTIES TO THIS AGREEMENT AS FOLLOWS:

1. That the entire Contract Documents, including the Advertisement for Bids, Instructions to Bidders, Bid Proposal, Bid Bond, Agreement, Performance Bond, Labor, Material and Tax Payment Bond, Notice of Award, Notice to Proceed, Conditions of Contract, Special Conditions, Drawings, Specifications and all addenda thereto, as prepared by the City of Farmington, are hereby made a part of this contract.
2. That the payments to be made by the Owner to the Contractor shall be made in the manner provided for in the Conditions of Contract and on the basis of the prices set out in the Bid Proposal.
3. That the work shall be done to the satisfaction of the Owner and in full compliance with these Contract Documents.
4. That the work shall be completed within the time limit set out in the Bid Proposal and shall be delivered to the Owner free of all liens, claims, and demand of any kind for materials, equipment, supplies, services, labor, taxes and damages to property or person.
5. That, in the event any of the provisions of this Agreement are violated by the Contractor or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate such Contract, such notices to contain the reasons for such intention to terminate the Contract, and unless within ten (10) days after the serving of such notice upon the Contractor such violation shall cease and satisfactory arrangement for correction be made, the Contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety who shall have the right to take over and perform this Agreement, provided, however, that if the Surety does not commence performance thereof within thirty (30) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion of the Agreement for the account and at the expense of the Contractor, and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

The Contract Documents shall be executed with one (1) original, and five (5) certified copies, distributed as follows:

Contractor	1 certified copy
City of Farmington City Clerk	1 original
City of Farmington	3 certified copies
Bonding Company	1 certified copy

IN WITNESS WHEREOF, said parties hereto have hereunto set their hands and seals at Farmington, New Mexico the day and year first above written:

CITY OF FARMINGTON
A Municipal Corporation

(CONTRACTOR NAME)

By: _____
Title: Mayor

By: _____
Duly Authorized Signature

Date: _____

By: _____
(Printed Name)

(SEAL)

Title: _____

ATTEST:

Date: _____

City Clerk

Signer has read the document and affirms that it is true and complete and accurately represents the agreement of the parties.

Date: _____

NOTARY PUBLIC SIGNATURE (REQUIRED)

Approves Compliance NMSA 1978 Annotated,
Chapter 13 Public Purchases and Property:

State of New Mexico
County of San Juan

Chief Procurement Officer

(SEAL) _____
Signature of notarial officer
My commission expires: _____

Date: _____

Department Head Approval

New Mexico State Taxation and Revenue
Department Taxpayer Identification Number

Date: _____

Federal Taxpayer Identification or
Social Security Number

Legal Department Approved to Form

Date: _____

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CITY OF FARMINGTON, NEW MEXICO

PERFORMANCE BOND, FORM AF-11

(Required if Bid Amount is more than \$25,000)

BOND NO: _____

KNOW ALL MEN BY THESE PRESENTS:

THAT _____
(Insert name, address or legal title of Contractor)

as Principal, hereinafter called the Contractor, and _____
(Insert the legal title of the Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto the City of Farmington, a municipal corporation of San Juan County, New Mexico, as Obligee, hereinafter called Owner, in the amount of \$_____, plus estimated applicable taxes \$_____ (\$_____ plus estimated applicable taxes of \$_____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

WHEREAS, Contractor has, by written agreement dated _____ entered into an agreement with Owner for the construction of Taxiway E, F, and G Reconstruction at Four Corners Regional Airport, Bid #17-119587 in accordance with drawings and specifications prepared by the City of Farmington which agreement is by reference made a part hereof, and is hereinafter referred to as the agreement.

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

The Surety, for value received, hereby expressly stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect the Surety's obligation on this bond; and the Surety does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this agreement or to the work or specifications.

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

1. Complete the agreement in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Owner for completing the agreement in accordance with its terms and upon determination by Owner and Surety of the lowest responsible bidder, arrange for an agreement between such bidder and Owner, and make available as work progresses (even though there should be a default or a succession of defaults under the agreement or agreements of completion arranged under this paragraph) sufficient funds to pay the cost of completion but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof.

The Contractor shall guarantee any work performed under this bond against omission of material or defective materials and workmanship for a period of one (1) year following its completion and acceptance.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators, or successors of Owner.

Venue upon any suit brought upon this bond shall be in the District Court of San Juan County, New Mexico.

SIGNED AND SEALED THIS _____ DAY OF _____, 2017.

In presence of:

Contractor-Principal

Surety

By: _____

By: _____

Title: _____

Title: _____

Street Address

Street Address

Mailing Address

Mailing Address

City, State, Zip Code

City, State, Zip Code

Telephone Number

Phone Number

THIS BOND MUST BE ACCOMPANIED BY A POWER OF ATTORNEY, EFFECTIVELY DATED

Note: This bond is issued simultaneously with another bond
Conditioned for the full and faithful payment for all labor
and material of the contract.

CITY OF FARMINGTON, NEW MEXICO

LABOR, MATERIAL AND TAX PAYMENT BOND, FORM AF-12

KNOW ALL MEN BY THESE PRESENTS:

THAT, _____
(Insert name, address or legal title of Contractor)
as Principal, hereinafter called the Contractor, and _____
(Insert the legal title of the Surety)
a corporation organized and existing under and by virtue of the laws of the State of _____
and authorized to do business in the State of _____, hereinafter called the Surety, are held
and firmly bound unto the City of Farmington, a municipal corporation of San Juan County, New Mexico,
as Obligee, hereinafter called the Owner, in the amount of _____, plus applicable
taxes of _____ (\$ _____, PLUS \$ _____ estimated applicable taxes) for the
payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors
and assigns jointly and severally firmly by these presents.

WHEREAS, Contractor has by written instrument dated _____, entered into an
agreement described as follows:

Taxiway E, F, and G Reconstruction at Four Corners Regional Airport
PROJECT # AIP 3-35-0016-039-2016, BID # 17-119587

The work to be performed under this contract shall consist of furnishing all labor, equipment, and materials
Taxiway E, F, and G will be reconstructed to include pavement removal, excavation, subbase course, base
course, asphalt paving, electrical, and pavement marking.

which agreement is by reference made a part hereof, and is hereinafter referred to as the agreement.

NOW, THEREFORE, the condition of this obligation is such that if the Contractor shall pay as they
become due, all just claims for labor performed and materials and supplies furnished and taxes due the
State of New Mexico arising out of construction services upon or for the work under said agreement,
pursuant to Sections 13-4-18 through 13-4-20 NMSA 1978, whether said labor be performed and materials
and supplies be furnished or taxes be accrued under the original agreement or any agreement thereunder,
then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however,
to the following conditions:

The right to sue on this bond accrues only to the Owner and the parties to whom New Mexico
Statutes Annotated, 1978, 13-4-18 through 13-4-20, as amended, grant such right; and any such right shall
be exercised only in accordance with the provisions and limitations of said statutes.

The Surety, for value received, hereby expressly stipulates and agrees that no change, extension
of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or
the specifications accompanying the same shall in any way affect the Surety's obligation on this bond; and
the Surety does hereby waive notice of any such change, extension of time, alteration or addition to the
terms of this agreement or to the work or specifications.

Venue upon any suit brought upon this bond shall be in the District Court of San Juan County, New
Mexico.

This bond is issued simultaneously with another bond conditioned for the full and faithful
performance of the contract.

SIGNED AND SEALED this _____ day of _____, 2017.

In presence of:

_____	Contractor-Principal
_____	By: _____
_____	Title: _____
Surety	_____
By: _____	Street Address
Title: _____	_____
_____	Mailing Address
Surety's Street Address	_____
_____	City, State and Zip Code
Surety's Mailing Address	_____
_____	Phone Number
City, State, Zip Code	_____
_____	_____
Phone Number	_____

THIS BOND MUST BE ACCOMPANIED BY A POWER OF ATTORNEY, EFFECTIVELY DATED

Note: This bond is issued simultaneously with another bond
Conditioned for the full and faithful performance
of the contract.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
INSURED	INSURER A:	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC						EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$ \$
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED \$ RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N <input type="checkbox"/> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory In NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER

CANCELLATION

	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

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CITY OF FARMINGTON, NEW MEXICO

NOTICE TO PROCEED, FORM AF-14

Owner : CITY OF FARMINGTON
800 Municipal Drive
Farmington, NM 87401

Date:

Project: Taxiway E, F, and G Reconstruction
at Four Corners Regional Airport

Project #: AIP 3-35-0016-039-2016

Bid #: 17-119587

Contractor:

The Contractor is hereby notified to commence work on _____, in accordance with the agreement dated _____, 2017, and the Contractor is required to complete the above referenced project no later than _____.

An acknowledged copy of this Notice must be returned to the Owner's Central Purchasing Department, to the above address, attention Contracts Administrator.

Owner: City of Farmington

By: _____
Kristi Benson, CPPO, CPPB
Chief Procurement Officer

Date: _____

Contractor: _____

Signature: _____

Printed Name

Title: _____

Date: _____

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CITY OF FARMINGTON, NEW MEXICO
CHANGE ORDER, FORM AF-15

Taxiway E, F, and G
Reconstruction at Four Corners
Regional Airport
PROJECT

AIP 3-35-0016-039-2016

CONTRACTOR

PROJECT #
17-119587
BID #

DATE INITIALED

PURCHASE ORDER #

1. IN ACCORDANCE with the specifications of the contract dated _____, 2017 between the owner and the contractor, the contractor is hereby authorized and directed as follows:

2. WORK TO BE PERFORMED UNDER THE FOLLOWING TERMS: lump sum_unit price;_cost plus (document direct costs, overhead & profit)

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>TOTAL COST</u>
-----------------	--------------------	-----------------	-------------------	-------------------

3. REASON FOR WORK OR JUSTIFICATION:

- ____Engineering error or omission
- ____Owner or division request
- ____Omitted from job scope or bid package
- ____Unforeseen circumstances
- ____Order by governmental agencies
- ____Contractor's failure to perform or install correctly
- ____Damaged or defective equipment causing a change in planning, concept or design

5. THIS CHANGE WILL RESULT IN THE FOLLOWING ADJUSTMENT OF (contract) (work order) COST:

- ORIGINAL AMOUNT: \$ _____
- PREVIOUS CHANGE ORDER: \$ _____
- THIS CHANGE ORDER: \$ _____
- REVISED AMOUNT: \$ _____

ALL OTHER TERMS AND CONDITIONS OF THE CONTRACT REMAIN UNCHANGED.

DELAYS IN THE WORK FOR WHATEVER REASONS WILL NOT BE A BASIS FOR ANY EXTRA COMPENSATION

ESTIMATED AMOUNTS ABOVE WILL BE THE CONTROL COST FOR THIS WORK.

4. CHANGE IN CONTRACT TIME:
(decrease) (increase) _____days

OWNER HAS THE RIGHT TO REJECT ALL COSTS WHICH ARE IN EXCESS OF CONTROL COST.

APPROVED FOR CONTRACTOR:

AUTHORIZED FOR CITY OF FARMINGTON:

Contractor's signature on this change order acts as an express waiver to seek any additional costs or time as a result of the work described in the change order.

BY: _____ DATE: _____
PREPARED BY: _____
TITLE: _____

BY: _____ DATE: _____
TITLE: _____
BY: _____ DATE: _____
TITLE: _____

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CITY OF FARMINGTON, NEW MEXICO

CERTIFICATE OF SUBSTANTIAL COMPLETION, FORM AF-16

Owner: CITY OF FARMINGTON
800 Municipal Drive
Farmington, NM 87401

Date:

Project: Taxiway E, F, and G
Reconstruction at Four Corners Regional Airport

Project #: AIP 3-35-0016-039-2016

Bid #: 17-119587

Contractor:

Through this correspondence we are documenting beneficial acceptance of the above referenced project completed substantially in accordance with the plans and specifications on _____.

The City will accept full maintenance responsibilities commencing _____, pending completion of warranty work if required, and a final warranty inspection.

You are required to return an acknowledged copy of this Certificate of Substantial Completion to the Owner's Central Purchasing Department, to the above address, attention Contracts Administrator.

Owner: City of Farmington

Kristi Benson, CPPO, CPPB
Chief Procurement Officer

Acknowledged: _____

Contractor: _____

By: _____

Title: _____

Copy to: City Clerk
Administrative Services
Purchasing - Contracts Administrator
File

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CITY OF FARMINGTON, NEW MEXICO

RELEASE AND WAIVER OF LIENS, FORM AF-18

With reference to Bid # 17-119587 Project # AIP 3-35-0016-039-2016 dated _____, 2017, as amended, between the undersigned Contractor _____ (name of Contractor) and CITY OF FARMINGTON (Owner) for Taxiway E, F, and G Reconstruction at Four Corners Regional Airport (Project) at Farmington, New Mexico (location of Owner's premises), the Contractor hereby certifies that it has made full payment of all costs, charges and expenses incurred by it or on its behalf for work, labor, services, materials and equipment supplied to the foregoing premises or used in connection with its performance under said Contract.

The Contractor further certifies that to its best knowledge and belief, each of its subcontractors and material men has made full payment of all costs, charges and expenses incurred by them or on their behalf for work, labor, services, materials and equipment supplied to the foregoing premises or used by them in connection with said Contract.

In consideration of \$ _____ constitutes complete and total payment, the Contractor hereby remises, releases and forever discharges the CITY OF FARMINGTON (Owner), its premises and property and the Engineer, from all bills, liens and claims of every nature arising out of or in connection with the performance of said Contract and any amendments thereto, except as set forth in the Contractor's Statement Concerning Claims (Form AF-20).

The foregoing shall not relieve the Contractor of its obligations under the provisions of said Contract, as amended, which by their nature survive completion of the Work including, without limitation, warranties, guarantees and indemnities.

Executed this _____ day of _____, 20__.

State of _____

Name of Contractor

County of _____

Subscribed and Sworn to before me this
____ day of _____, 20__

By _____

Notary Public _____

Title _____

My commission expires: _____

Original - City of Farmington Contracts Administrator

Copy to: Contractor

Project Manager/Construction Inspection

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CITY OF FARMINGTON, NEW MEXICO

SUBCONTRACTOR'S RELEASE AND WAIVER OF LIENS, FORM AF-19

THE UNDERSIGNED, for and in consideration of the sum indicated below, the receipt whereof is hereby acknowledged, which is in full/partial payment of all sums due him for work performed and/or materials furnished in connection with the following described project, does hereby waive any right which he may have at this date to file any liens, mechanics, materialmen, or otherwise against said property for or by reason of any work performed or any materials furnished in undersigned affirms that there are no amounts included in this payment for labor or materials furnished by other parties which can become a lien against the described project.

PROJECT: Taxiway E, F, and G Reconstruction at Four Corners Regional Airport, Bid #17-119587

LIEN WAIVER DATE: _____

AMOUNT: _____

() FULL () PARTIAL

TYPE OF WORK AND/OR MATERIAL
FURNISHED

Executed this _____ day of _____, 20__.

CONTRACTOR: _____

Mailing Address: _____

SUBCONTRACTOR: _____

Mailing Address: _____

By: _____

Title: _____

By: _____

Title: _____

STATE OF NEW MEXICO)

) ss.

COUNTY OF SAN JUAN)

Subscribed and Sworn to before me this _____ day of _____, 20__.

Notary Public: _____

My Commission Expires: _____

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CITY OF FARMINGTON, NEW MEXICO

CONTRACTOR'S STATEMENT CONCERNING CLAIMS, FORM AF-20

For the purpose of obtaining final payment of funds due me for the satisfactory completion of Taxiway E, F, and G Reconstruction at Four Corners Regional Airport, Bid #17-119587 in conformity with the contract documents, including the plans and specifications or authorized modifications thereof, I hereby certify that all lawful claims for labor performed and material, supplies and services furnished by me or any sub-contractor for the said work, have been fully paid or satisfied, with the exception of the following claims:

It is requested that final payment of funds due me under the contract be made.

Executed this _____ day of _____, 20__.

CONTRACTOR: _____

Mailing Address: _____

By: _____

Title: _____

STATE OF NEW MEXICO)

) ss.

COUNTY OF SAN JUAN)

Subscribed and Sworn to before me this _____ day of _____, 20__.

Notary Public: _____

My Commission Expires: _____

Original: City of Farmington Contracts Administrator

Copy to: Contractor

Project Manager/Construction Inspection

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CITY OF FARMINGTON, NEW MEXICO

WAIVER FOR PARTIAL PAYMENT, FORM AF-21

The undersigned surety on the bond of the contractor for the construction of Taxiway E, F, and G Reconstruction at Four Corners Regional Airport, Bid #17-119587 hereby consents to the partial payment to the contractor of amounts for materials under the provisions of the Contract Documents dated _____, 20__ by the City of Farmington and _____ acknowledges that such payment whether or not in strict compliance with the provisions of the above contract, shall not preclude or stop the City of Farmington from showing the true character and quantity of the materials furnished or from recovering from the contractor or his sureties such damages as the City of Farmington may sustain by reason of deficiency in quantity or quality of the material with respect to which partial payment was made.

IN WITNESS WHEREOF, We have hereunto set our hands and seals at _____
_____ County, New Mexico, this _____ day of _____, 2017

Sureties:

Surety

By: _____

Title: _____

Surety's Street Address

Surety's Mailing Address

City, State, Zip Code

Phone Number

City Clerk

_____, 2017

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TAB VI
FEDERAL DOCUMENTS

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TAB VI

INDEX

FEDERAL AND SUPPLEMENTAL DOCUMENTS

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PROPOSAL SHEETS

PROPOSAL SHEETS (To be included with bid).....8 Pages

CAMPAIGN CONTRIBUTION DISCLOSURE FORM
EQUAL EMPLOYMENT OPPORTUNITY STATEMENT
LETTER OF INTENT
BIDDERS LIST
CERTIFICATION OF NONSEGREGATED FACILITIES
BUY AMERICA CERTIFICATION

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CAMPAIGN CONTRIBUTION DISCLOSURE FORM

Pursuant to Chapter 81, Laws of 2006, any prospective contractor seeking to enter into a contract with any state agency or local public body must file this form with that state agency or local public body. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or local public body during the two years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars (\$250) over the two year period.

THIS FORM MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

“Applicable public official” means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

“Campaign Contribution” means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official's behalf for the purpose of electing the official to either statewide or local office. “Campaign Contribution” includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or un-reimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

“Contract” means any agreement for the procurement of items of tangible personal property, services, professional services, or construction.

“Family member” means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law.

“Pendency of the procurement process” means the time period commencing with the public notice of the request for proposals and ending with the award of the contract or the cancellation of the request for proposals.

“Person” means any corporation, partnership, individual, joint venture, association or any other private legal entity.

“Prospective contractor” means a person who is subject to the competitive sealed proposal process set forth in the Procurement Codes or is not required to submit a competitive sealed proposal because that person qualifies for a sole source or a small purchase contract.

“Representative of a prospective contractor” means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

DISCLOSURE OF CONTRIBUTIONS:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Name of Applicable Public Official: _____

Date Contribution(s) Made: _____

Amount(s) of Contribution(s): _____

Nature of Contribution(s): _____

Purpose of Contributions(s): _____

Signature

Date

Title (position)

EQUAL EMPLOYMENT OPPORTUNITY STATEMENT

A Bidder must have properly completed this form to be considered an eligible Bidder.

The Bidder shall complete the following statement by checking the appropriate boxes.

The Bidder *has* ☐ *has not* ☐
participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, Executive Order 11114, or Executive Order 11246.

The Bidder *has* ☐ *has not* ☐
submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by Proposed Subcontractors will be obtained prior to Award of Subcontracts.

If the Bidder has participated in a previous Contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder shall submit a compliance report on Standard Form 100, 'Employee Information Report EEO-1' prior to the Award of Contract.

DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION: The undersigned has satisfied the requirements of the specifications in the following manner (please check the appropriate space):

☐ The Bidder is committed to a minimum of _____% DBE utilization on this Project.

☐ The Bidder (if unable to meet the goal of _____% DBE) is committed to a minimum of _____% DBE utilization on this Project and has submitted documentation showing good faith effort.

Contractor: _____

By: _____
(Signature) (Title)

Address: _____

Phone Number: _____ Zip Code: _____

LETTER OF INTENT

Name of Bidder's Firm: _____

Bidder's Address: _____

City: _____ State: _____ Zip: _____

Name of DBE Firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone (including area code): _____

Description of work to be performed by DBE firm:

Bidder intends to utilize the above-named minority firm for the work described above. The estimated amount of work is valued at \$_____

If the above-named Bidder is not determined to be the successful Bidder, the Letter of Intent shall be null and void.

(Copy this page for each minority subcontractor)

BIDDERS LIST

The Bidder shall submit the following information for all firms Bidding or quoting Subcontracts on D.O.T.-assisted Projects.

Project Title: _____

Date: _____

Prime Contractor: _____

Address: _____

Phone/Fax: _____

Name of Firm	Address	Type of Work to be Performed on Contract	Certified DBE		Date Firm Established	AGR*
			YES	NO		

***AGR – Annual Gross Receipts**

Enter 1 for Less than \$1 Million

Enter 2 for More than \$1 Million, Less than \$5 Million

Enter 3 for More than \$5 Million, Less than \$10 Million

Enter 4 for More than \$10 Million, Less than \$15 Million

Enter 5 for More than \$15 Million

CERTIFICATION OF NONSEGREGATED FACILITIES

The Federally Assisted Construction Contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments and that he does not permit his employees to perform their services at any location under his control, where segregated facilities are maintained. The Federally Assisted Construction Contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments and that he does not permit his employees to perform their services at any location under his control, where segregated facilities are maintained. The Federally Assisted Construction Contractor agrees to that a breach of this certification is a violation of the Equal Opportunity Clause in this Contract.

As used in this certification the term "segregated facilities" means waiting room, work areas, rest rooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas. Transportation and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or any other reason. The Federally Assisted Construction Contractor agrees that (except where he has obtained identical certifications from Proposed Subcontractors for specific time periods) he will obtain identical certifications from Proposed Subcontractors prior to the Award of Subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that he will retain such certifications for his files.

CERTIFICATION:

The information above is true and complete to the best of my knowledge and behalf.

Contractor/Subcontractor

(Name of Firm)

(Date)

(Signature)

(Title)

Certification requirements for procurement of steel or manufactured products.

If steel, iron, or manufactured products (as defined in §§661.3 and 661.5 of this part) are being procured, the appropriate certificate as set forth below shall be completed and submitted by each bidder or offeror in accordance with the requirement contained in §661.13(b) of this part.

[71 FR 14117, Mar. 21, 2006, as amended at 72 FR 53696, Sept. 20, 2007]

Buy America Certification (Title 49 U.S.C. Section 50101)

Airport Name:	Four Corners Regional Airport
A.I.P. Project No.	3-35-0016-039-2016
Schedule I	Reconstruct Connector Taxiway G
Schedule II	Reconstruct Taxiway F
Schedule III	Reconstruct Taxiway G
Schedule IV	Reconstruct Taxiway E

This solicitation and any resulting contract are subject to the Buy America requirements of 49 U.S.C. Section 50101. 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 percent 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 percent.

(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/procurement/federal_contract_provisions/media/buy_american_waiver.xls

As a matter of bid responsiveness, the bidder or offeror must complete and submit this certification with their bid proposal. The bidder must sign and date the certification. The bidder/offeror must indicate how they propose to comply with the Buy America provision by selecting one of the following certification statements.

☐ **The bidder hereby certifies that it will comply with Title 49 U.S.C Section 50101(a) by only installing steel and manufactured products produced in the United States of America. The bidder further agrees that if chosen as the apparent low bid, it will submit documentation to the owner that demonstrate all steel and manufactured products are 100% manufactured in the United States.**

☐ **The bidder hereby certifies that it cannot fully comply with the Buy America preferences of Title 49 U.S.C Section 50101(a); the bidder therefore requests a waiver per Title 49 U.S.C Section 50101(b). The bidder further agrees that upon notification from the Owner, the bidder identified with the apparent low bid agrees to prepare and submit a waiver request and component calculation information to the owner within _____ calendar days of the date of the notice of apparent low bid.**

Bidder's Firm Name

Date

Signature

Certification Regarding Debarment Suspension, Ineligibility and Voluntary Exclusion

The bidder/offeror certifies, by submission of this proposal or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees by submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

General Decision Number: NM160049 01/08/2016 NM49

Superseded General Decision Number: NM20150049

State: New Mexico

Construction Type: Highway

Counties: Dona Ana and San Juan Counties in New Mexico.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the 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 \$10.15 (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 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date 0 01/08/2016

ELEC0611-003 07/01/2014

	Rates	Fringes
ELECTRICIAN (Boom Operator).....	\$ 29.79	12.74

* TEAM0492-003 04/01/2014

SAN JUAN

	Rates	Fringes
TRUCK DRIVER (Dump).....	\$ 14.65	6.20

SUNM2011-003 08/25/2011

	Rates	Fringes
CARPENTER (Includes Form Work)		
Dona Ana.....	\$ 14.15	0.44
San Juan.....	\$ 13.42	0.44

CEMENT MASON/CONCRETE FINISHER...\$ 13.65 0.26

ELECTRICIAN (Includes Traffic Signalization and Installation)		
Dona Ana.....	\$ 25.91	9.45
San Juan.....	\$ 24.46	8.56

HIGHWAY/PARKING LOT STRIPING:

Includes Highway Line/Parking Lot Line Striping and Line Striping Truck Driver

Dona Ana.....	\$ 15.44	0.35
San Juan.....	\$ 14.39	0.35

IRONWORKER, REINFORCING

Dona Ana.....	\$ 22.61	6.03
San Juan.....	\$ 16.41	5.85

LABORER

Common or General		
Dona Ana.....	\$ 11.95	0.35
San Juan.....	\$ 11.48	0.35
Flagger/Cone Setter.....	\$ 14.27	0.35
Mason Tender-		
Cement/Concrete.....	\$ 10.25	0.35
Pipelay.....	\$ 17.13	5.04

POWER EQUIPMENT OPERATOR:

Backhoe/Excavator/Trackhoe		
Dona Ana.....	\$ 17.74	0.26
San Juan.....	\$ 16.27	1.51
Bobcat/Skid Loader.....	\$ 14.56	0.26
Broom Sweeper.....	\$ 16.67	1.57
Grader/Blade.....	\$ 17.64	1.51
Loader(Front End).....	\$ 16.53	0.26
Mechanic.....	\$ 23.24	1.51
Oiler.....	\$ 22.08	8.72
Piledriver.....	\$ 16.26	0.26
Roller (Asphalt and Dirt)		
Dona Ana.....	\$ 16.27	1.51
San Juan.....	\$ 12.91	1.60
Trencher		
Dona Ana.....	\$ 15.22	0.26
San Juan.....	\$ 15.93	0.26

TRUCK DRIVER

Dump Truck		
Dona Ana.....	\$ 15.04	0.26
Flatbed Truck.....	\$ 13.30	0.26
Pickup Truck		
Dona Ana.....	\$ 12.14	0.26
San Juan.....	\$ 12.95	0.26
Water Truck.....	\$ 13.51	1.51

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

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.

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END OF GENERAL DECISION

General Decision Number: NM170049 02/03/2017 NM49

Superseded General Decision Number: NM20160049

State: New Mexico

Construction Type: Highway

Counties: Dona Ana and San Juan Counties in New Mexico.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 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 \$10.20 (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 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date

0 01/06/2017

1 02/03/2017

ELEC0611-003 07/01/2014

	Rates	Fringes
ELECTRICIAN (Boom Operator).....	\$ 29.79	12.74

* TEAM0492-003 01/01/2017

SAN JUAN

	Rates	Fringes
TRUCK DRIVER (Dump).....	\$ 16.00	7.02

SUNM2011-003 08/25/2011

	Rates	Fringes
CARPENTER (Includes Form Work)		
Dona Ana.....	\$ 14.15	0.44
San Juan.....	\$ 13.42	0.44
CEMENT MASON/CONCRETE FINISHER...	\$ 13.65	0.26

ELECTRICIAN (Includes Traffic Signalization and Installation)

Dona Ana.....	\$ 25.91	9.45
San Juan.....	\$ 24.46	8.56

HIGHWAY/PARKING LOT STRIPING:

Includes Highway Line/Parking Lot Line Striping and Line Striping Truck Driver

Dona Ana.....	\$ 15.44	0.35
San Juan.....	\$ 14.39	0.35

IRONWORKER, REINFORCING

Dona Ana.....	\$ 22.61	6.03
San Juan.....	\$ 16.41	5.85

LABORER

Common or General

Dona Ana.....	\$ 11.95	0.35	
San Juan.....	\$ 11.48	0.35	
Flagger/Cone Setter.....	\$ 14.27	0.35	
Mason Tender-Cement/Concrete.....	\$ 10.25		0.35
Pipelay.....	\$ 17.13	5.04	

POWER EQUIPMENT OPERATOR:

Backhoe/Excavator/Trackhoe

Dona Ana.....	\$ 17.74	0.26
San Juan.....	\$ 16.27	1.51
Bobcat/Skid Loader.....	\$ 14.56	0.26
Broom Sweeper.....	\$ 16.67	1.57
Grader/Blade.....	\$ 17.64	1.51
Loader(Front End).....	\$ 16.53	0.26
Mechanic.....	\$ 23.24	1.51
Oiler.....	\$ 22.08	8.72
Piledriver.....	\$ 16.26	0.26
Roller (Asphalt and Dirt)		
Dona Ana.....	\$ 16.27	1.51
San Juan.....	\$ 12.91	1.60
Trencher		
Dona Ana.....	\$ 15.22	0.26
San Juan.....	\$ 15.93	0.26

TRUCK DRIVER

Dump Truck

Dona Ana.....	\$ 15.04	0.26
Flatbed Truck.....	\$ 13.30	0.26
Pickup Truck		
Dona Ana.....	\$ 12.14	0.26
San Juan.....	\$ 12.95	0.26
Water Truck.....	\$ 13.51	1.51

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.

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END OF GENERAL DECISION

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SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS 10 Pages

1. State and Federal Regulations
2. Disadvantaged Business Enterprises (DBE)
3. Notice for Solicitation for Bids
4. Notice to Prospective Federally Assisted Construction Contractors
5. Notice to Prospective Subcontractors of Requirements for Certification of Nonsegregated Facilities
6. Standard Federal Equal Employment Opportunity Construction Contract Specifications
7. Buy American - Steel and Manufactured Products for Construction Contracts

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SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

1. State and Federal Regulations

- 1.1 The successful Contractor must fully comply with all applicable Federal and State requirements pertaining to the work, employees used on the job and any special requirements pertaining to work procedures.

2. Disadvantaged Business Enterprises (DBE)

- 2.1 Policy. It is policy of the Department of Transportation (D.O.T.) that Disadvantaged Business Enterprises (DBE's), 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.
- 2.2 DBE Obligation. The Contractor or Subcontractor shall not discriminate on 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 award and administration of D.O.T.-assisted Contracts. Failure by 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 Sponsor deems appropriate.
- 2.3 Prompt Payment. The Prime Contractor agrees to pay each Subcontractor under this Prime Contract for satisfactory performance of its Contract no later than 10 days from receipt of each payment the Prime Contractor receives from the Sponsor. The Prime Contractor further agrees to return retainage payments to each Subcontractor within 10 days after the Subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Sponsor. This clause applies to both DBE and non-DBE Subcontractors.
- 2.4 Contract Goals. The Bidder shall Subcontract 4.70 percent of the dollar value of the total amount of a D.O.T.-assisted Contract to qualified DBE Contractors.
- 2.5 DBE Contractors or Subcontractors. At the time of bid, the Bidder shall submit:
 - A. The names and addresses of DBE firms that will participate in the contract;
 - B. A description of work that each DBE will perform;
 - C. The dollar amount of the participation of each DBE firm;
 - D. Written and signed documentation of commitment to use the DBE Subcontractor whose participation it submits to meet a Contract goal;
 - E. Written and signed confirmation from the DBE that it is participating in the Contract as provided in the Prime Contractor's commitment;

If the Bidder fails to meet the Contract goal, evidence of good faith efforts, as described below, shall be submitted.

A bidder who fails to meet these requirements and who cannot show good faith effort will be considered non-responsive.

2.6 Good Faith Efforts. The following actions, by the Bidder, are generally considered a sign of good faith effort. This list is not exclusive or exhaustive, but should be used as a guide in determining good faith effort.

- A. Attendance at Pre-bid meetings scheduled to inform DBE's of the Project.
- B. Advertisement in general circulation, trade association and minority focus media concerning subcontracting opportunities.
- C. Written notice to DBE's, allowing sufficient time for reply.
- D. Follow-up of initial solicitation.
- E. Section of portions of the work likely to be performed by DBE's.
- F. Provide interested DBE's adequate information for bidding.
- G. Negotiation with interested DBE's.
- H. Assist interested DBE's with bonding; insurance; credit, or in obtaining equipment, supplies and materials.
- I. Use of minority contractors' groups and minority business assistance offices.

2.7 Bidders List. The bidder shall submit the name, address, DBE status, age and gross receipts of all firms bidding or quoting subcontractors on D.O.T.-assisted projects.

3. Notice For Solicitations For Bids

(BID NOTICE) – 41 CFR PART 60-4.2 (VERSION 1, 1/5/90)

- 3.1 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.
- 3.2 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 45.9%.

Goals for Female participation for each trade 6.9%

These goals are applicable to all the Contractor's Construction work (whether or not it is Federal or Federally-assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the 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 Nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) and its efforts to meet the goals. The hours of minority and female employment and training shall be substantially uniform throughout the length of the Contract and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project, for the sole purpose of meeting the Contractor's goals, shall be a violation of the Contract, the Executive Order and the regulations in 41 CFR Part 604. Compliance with the goals will be measured against the total work hours performed.

- 3.3 The Contractor shall provide written notification to the Director OFCCP, within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address and telephone number of the Subcontractor; employer identification number of the Subcontractor; estimated dollar amount of the Subcontract; estimated starting and completion dates of Subcontract; and the geographical area in which the Subcontract is to be performed.
- 3.4 As used in this notice and in the Contract resulting from this solicitation, the "covered area" is the State of New Mexico.

4. Notice To Prospective Federally Assisted Construction Contractors

41 CFR 60-1.8 (VERSION 1, 5/1/90)

- 4.1 A Certification of Nonsegregated Facilities shall be submitted prior to the award of a Subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause.
- 4.2 Contractors receiving Federally-assisted Construction Contract Awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the following notice to prospective Subcontractors for supplies and Construction Contracts where the Subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

5. Notice To Prospective Subcontractors Of Requirements For Certification Of Nonsegregated Facilities

- 5.1 A Certification of Nonsegregated Facilities shall be submitted prior to the award of a Federally-assisted Construction Contract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause.
- 5.2 Contractors receiving Subcontract Awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the following notice to prospective Subcontractors for supplies and Construction Contracts where the Subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

CERTIFICATION TO BE SUBMITTED BY FEDERALLY ASSISTED CONSTRUCTION CONTRACTORS AND THEIR SUBCONTRACTORS (APPLICABLE TO FEDERALLY ASSISTED CONSTRUCTION CONTRACTS AND RELATED SUBCONTRACTS EXCEEDING \$10,000 WHICH ARE NOT EXEMPT FROM THE EQUAL OPPORTUNITY CLAUSE)

6. Standard Federal Equal Employment Opportunity Construction Contract Specifications (41 CFR 60-4.3) (VERSION 1, 1/5/90)

- 6.1 As used in these specifications:
- A. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - B. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
 - C. "Employer Identification Number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
 - D. "Minority"
 - 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).
- 6.2 Whenever the Contractor, or any Subcontractor at any tier, Subcontracts a portion of the Work involving any construction trade, it shall physically include in each Subcontract in excess of \$10,000 the provisions of these Specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.
- 6.3 If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 6.4 The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these Specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction Contractors performing construction work in a geographical area where they do not have a Federal or Federally-assisted Construction Contract shall apply the minority and female goals established for the geographical area where the Work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
- 6.5 Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.
- 6.6 In order for the nonworking 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.

- 6.7 The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these Specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:
- A. Ensure and maintain a working environment free of harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents and other on-site 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 the 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 was not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - E. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
 - F. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees

at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

- G. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
- H. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- I. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures and tests to be used in the selection process.
- J. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- K. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- L. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- M. Ensure that seniority practices, job classifications, work assignments and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

- N. Ensure that all facilities and company activities are nonsegregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - O. Document and maintain a record of all solicitations of offers for subcontracts from minority and female Construction Contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - P. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 6.8 Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
- 6.9 A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female and all women, both minority and nonminority. 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.
- 6.10 The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
- 6.11 The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 6.12 The Contractor shall carry out such sanctions and penalties for violation of these Specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing Subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these Specifications and Executive Order 11246, as amended.

- 6.13 The Contractor, in fulfilling its obligations under these Specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with these requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- 6.14 The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.
- 6.15 Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the

Public Works Employment Act of 1977 and the Community Development Block Grant Program).

7. Buy American – Steel And Manufactured Products For Construction Contracts
(JAN 1991)

7.1 The Aviation Safety and Capacity Expansion Act of 1990 provides that preference be given to steel and manufactured products produced in the United States when funds are expended pursuant to a grant issued under the Airport Improvement Program. The following terms apply:

- A. Steel and manufactured products. As used in this clause, steel and manufactured products include (1) steel produced in the United States or (2) a manufactured product produced in the United States, if the cost of its components mined, produced or manufactured in the United States exceeds 60 percent of the cost of all its components and final assembly has taken place in the United States. Components of foreign origin of the same class or kind as the products referred to in subparagraphs (b) (1) or (2) shall be treated as domestic.
- B. Components. As used in this clause, components means those articles, materials and supplies incorporated directly into steel and manufactured products.
- C. Cost of components. This means the costs for production of the components, exclusive of final assembly labor costs.

7.2 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 section 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 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 percent 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 percent.
- C. Labor Costs. In this section, labor costs involved in final assembly are not included in calculating the cost of components.

7.3 The successful bidder will be required to assure that only domestic steel and manufactured products will be used by the Contractor, Subcontractors, materialmen and suppliers in the performance of this Contract, except those-

- A. that the U.S. Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality;
- B. that the U.S. Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, that domestic preference would be inconsistent with the public interest; or
- C. that inclusion of domestic material will increase the cost of the overall.

CERTIFICATION OF INCLUSION OF LABOR & EEO REQUIREMENTS IN
SUBCONTRACTS

CERTIFICATION OF INCLUSION OF LABOR & EEO REQUIREMENTS IN
SUBCONTRACTS1 Page

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A.I.P. Project NO. 3-35-0016-039-2016 AIRPORT : Four Corners Regional Airport
The Prime Contractor whose signature appears below certifies that a Subcontract was awarded on _____ to _____ to perform the following Work: _____

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SUPPLEMENTAL CONTRACT ARTICLES

ARTICLE 1

Civil Rights Act of 1964, Title VI – 49 CFR Part 21 - Contractual Requirements

(Version 1, 1/5/90)

During the performance of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. Compliance with Regulations.

The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, "D.O.T.") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Contract.

2. Nondiscrimination.

The Contractor, with regard to the Work performed by it during the Contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of Subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the Contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment.

In all solicitations either by competitive bidding or negotiation made by the Contractor for Work to be performed under a Subcontract, including procurements of materials or leases of equipment, each potential Subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this Contract and the Regulations relative to nondiscrimination on the grounds of race, color or national origin.

4. Information and Reports.

The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the Sponsor or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Sponsor or the FAA, as appropriate and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance.

In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the Sponsor shall impose such Contract Sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

- A. Withholding of payments to the Contractor under the Contract until the Contractor complies and/or
- B. Cancellation, termination, or suspension of the Contract, in whole or in part.

6. Incorporation of Provisions.

The Contractor shall include the provisions of paragraphs 1 through 5 in every Subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Contractor shall take such action with respect to any Subcontract or procurement as the Sponsor or the FAA may direct as a means of enforcing such provisions including Sanctions for noncompliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or supplier as a result of such direction, the Contractor may request the Sponsor to enter into such litigation to protect the interests of the Sponsor and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

ARTICLE 2

Airport And Airway Improvement Act of 1982, Section 520 General Civil Rights Provisions

(Version 1, 1/5/90)

The Contractor assures that it will comply with pertinent statutes, Executive orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision obligates the tenant/concessionaire/lessee or its transferee for the period during which Federal assistance is extended to the airport program, except where Federal assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon. In these cases the provision obligates the party or any transferee for the longer of the following periods: (a) the period during which the property is used by the Airport Sponsor or any transferee for a purpose for which Federal assistance is extended, or for another purpose involving the provision of similar services or benefits or (b) the period during which the Airport Sponsor or any transferee retains ownership or possession of the property. In the case of Contractors, this provision binds the Contractors 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.

ARTICLE 3

Inspection Of Records – 49 CFR Part 18

(Version 1, 1/5/90)

The Contractor shall maintain an acceptable cost accounting system. The Sponsor, the FAA, the Comptroller General of the United States shall have access to any books, documents, paper and records of the Contractor which are directly pertinent to the specific Contract for the purposes of making an audit, examination, excerpts and transcriptions. The Contractor shall maintain all required records for three years after the Sponsor makes final payment and all other pending matters are closed.

ARTICLE 4

Rights To Inventions – 49 CFR Part 18

(Version 1, 1/5/90)

All rights to inventions and materials generated under this Contract are subject to Regulations issued by the FAA and the Sponsor of the Federal grant under which this Contract is executed. Information regarding these rights is available from the FAA and the Sponsor.

ARTICLE 5

Breach Of Contract Terms, Sanctions – 49 CFR Part 18

(Version 1, 1/5/90)

Any Violation or breach of the terms of this Contract on the part of the Contractor or Subcontractor may result in the suspension or termination of this Contract or such other action which may be necessary to enforce the rights of the parties of this agreement. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

ARTICLE 6

DBE Required Statements – 49 CFR Part 26

(11/19/01)

1. Policy.

It is the policy of the Department of Transportation (D.O.T.) that Disadvantaged Business Enterprises (DBE's) 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.

2. DBE Obligation.

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 D.O.T.-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 Sponsor deems appropriate.

3. Prompt Payment.

The Prime Contractor agrees to pay each Subcontractor under this Prime Contract for satisfactory performance of its Contract no later than seven (7) days from the receipt of each payment the Prime Contractor receives from the Sponsor. The Prime Contractor agrees further to return retainage payments to each Subcontractor within thirty (30) days after the Subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Sponsor. This clause applies to both DBE and non-DBE Subcontractor.

ARTICLE 7

Trade Restriction Clause – 49 CFR Part 30

(Version 1, 1/5/90)

The Contractor or Subcontractor, by submission of an offer and/or execution of a Contract, certifies that it:

- A. Is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);
- B. Has not knowingly entered into any Contract or Subcontract for this Project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens of nationals of a foreign country on said list;

- C. Has not procured any product or subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no Contract shall be awarded to a Contractor or Subcontractor who is unable to certify to the above. If the Contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the Project, the Federal Aviation Administration may direct through the Sponsor cancellation of the Contract at no cost to the Government.

Further, the Contractor agrees that, if awarded a Contract resulting from this solicitation, it will incorporate this provision for certification without modification in each Contract and in all Lower Tier Subcontracts. The Contractor may rely on the certification of a prospective Subcontractor unless it has knowledge that the certification is erroneous.

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

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

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

This certification concerns a matter within the jurisdiction of an agency of the United States of America and making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

ARTICLE 8

Airport And Airway Improvement Act Of 1982, Section 515 Veteran's Preference

(Revised 4/8/2013)

Veteran's Preference shall be included in all contracts for work on any project funded under this grant agreement which involves labor. Such provisions are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in Title 49 United States Code, Section 47112. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

ARTICLE 9

Termination Of Contract – 49 CFR Part 18

(Version 1, 1/5/90)

1. The Sponsor may, by written notice, terminate this Contract in whole or in part at any time, either for the Sponsor's convenience or because of failure to fulfill the Contract obligations. Upon receipt of such notice services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this Contract, whether completed or in progress, delivered to the Sponsor.
2. If the termination is for the convenience of the Sponsor, an equitable adjustment in the Contract Price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.
3. If the termination is due to failure to fulfill the Contractor's obligations, the Sponsor may take over the work and prosecute the same to completion by Contract or otherwise. In such case, the Contractor shall be liable to the Sponsor for any additional cost occasioned to the Sponsor thereby.
4. If, after notice of termination for failure to fulfill Contract obligations, it is determined that the Contractor had not so failed, the termination shall be deemed to have been effected for the convenience of the Sponsor. In such event, adjustment in the Contract Price shall be made as provided in paragraph 2 of this clause.
5. The rights and remedies of the Sponsor provided in this clause are in addition to any other rights and remedies provided by law or under this Contract.

ARTICLE 10

Clean Air And Water Pollution Control Requirements

(Version 1, 1/5/90)

Contractors and Subcontractors agree:

1. That any facility to be used in the performance of the Contract or Subcontract or to benefit from the Contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities.
2. To comply with all the requirements of Section 114 of the Clean Air Act, as amended, 42 U.S.C. 1857 et seq. and Section 308 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in Section 114 and Section 308 of the Acts, respectively and all other regulations and guidelines issued thereunder;
3. That, as a condition for the Award of this Contract, the Contractor or Subcontractor will notify the awarding official of the receipt of any communication from the EPA indicating that a facility to be used for the performance of or benefit from the Contract is under consideration to be listed on the EPA list of Violating Facilities;
4. To include or cause to be included in any Construction Contract or Subcontract which exceeds \$100,000 the aforementioned criteria and requirements.

ARTICLE 11

Davis Bacon Requirements - 29 CFR Part 5

(Version 1, Updated 2/14/2013)

(1) Minimum Wages

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

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

- (ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any

apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records 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 Sponsor 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 FAA. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Sponsor 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 FAA, 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 § 5.5(a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, 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.
- (ii) The contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and Trainees.

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the

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

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training

Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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

(5) Compliance With Copeland Act Requirements.

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

(6) Subcontracts.

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

(7) Contract Termination: Debarment.

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

(8) Compliance With Davis-Bacon and Related Act Requirements.

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

(9) Disputes Concerning Labor Standards.

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

(10) Certification of Eligibility.

- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

ARTICLE 12

Contract Work Hours And Safety Standards Act Requirements – 29 CFR Part 5

(Version 1, 1/5/90)

(1) Overtime Requirements.

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

(2) Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph 1 above, the Contractor or any Subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor or Subcontractor shall be liable to the United States (in the case of work done under Contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1. above, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 above.

(3) Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an Authorized Representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of Work performed by the Contractor or Subcontractor under any such Contract or any other Federal Contract with the same Prime Contractor, or any other Federally-assisted Contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 above.

(4) Subcontractors.

The Contractor or Subcontractor shall insert in any Subcontracts the clauses set forth in paragraphs 1 through 4 and also a clause requiring the Subcontractor to include these clauses in any Lower Tier Contracts. The Prime Contractor shall be responsible for compliance by any Subcontractor or Lower Tier Subcontractor with the clauses set forth in paragraphs 1 through 4.

(5) Working Conditions.

No Contractor or Subcontractor may require any laborer or mechanic employed in the performance of any Contract to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to his health or safety as determined under Construction Safety and Health Standards (29 CFR Part 1926) issued by the Department of Labor.

ARTICLE 13

Equal Employment Opportunity – 41 CFR Part 60-1.4(b)

(Version 1, 1/5/90)

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

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following:

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

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other Contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this Section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended and of the rules, regulations and relevant orders of the Secretary of Labor.
5. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965 and by rules, regulations and orders of the Secretary of Labor, or pursuant thereto and will permit access to his books, records and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or Federally-assisted Construction Contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965 and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every Subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or Vendor. The Contractor will take such action with respect to any Subcontract or Purchase Order as the administering agency may direct as a means of enforcing such provision, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or Vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

ARTICLE 14

Notices To Be Posted Per Paragraphs (1) And (3) Of The EEO CLAUSE –

41 CFR Part 60-1.4(b)

(Version 1, 1/5/90)

Equal Employment Opportunity is the Law – Discrimination is Prohibited by the Civil Rights Act of 1964 and by Executive Order No. 11246 Title VII of the Civil Rights Act of 1964 - Administered by:

The Equal Employment Opportunity Commission

Prohibits discrimination because of race, color, religion, sex, or national origin by Employers with 25 or more employees, by Labor Organizations with a hiring hall of 25 or more members, by Employment Agencies and by Joint Labor-Management Committees for Apprenticeship or Training.

Any person who believes he or she has been discriminated against should contact:

The Office of Federal Contract Compliance Programs
U.S. Department of Labor
Washington, D.C. 20210

ARTICLE 15

Standard Federal Equal Employment Opportunity Construction Contract Specifications (41 CFR 60-4.3)

(Version 1, 1/5/90)

1. As used in these specifications:

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

2. Whenever the Contractor, or any Subcontractor at any tier, Subcontracts a portion of the Work involving any Construction Trade, it shall physically include in each Subcontract in excess of \$10,000 the provisions of these Specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.

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

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these Specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction Contractors performing Construction Work in a geographical area where they do not have a Federal or Federally-assisted Construction Contract shall apply the minority and female goals established for the geographical area where the Work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal Procurement Contracting Officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these Specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:
 - A. Ensure and maintain a working environment free of harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to Work. The Contractor, where possible, will assign two or more women to each Construction Project. The Contractor shall specifically ensure that all foremen, superintendents and other on-site 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 the 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 was not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- E. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- F. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where Construction Work is performed.
- G. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site Supervisory Personnel such as superintendents, general foremen, etc., prior to the initiation of Construction Work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
- H. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- I. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures and tests to be used in the selection process.
- J. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

- K. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - L. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - M. Ensure that seniority practices, job classifications, work assignments and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - N. Ensure that all facilities and company activities are nonsegregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - O. Document and maintain a record of all solicitations of offers for Subcontracts from minority and female Construction Contractors and Suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - P. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female and all women, both minority and nonminority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally,) the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government Contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these Specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing Subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with these requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay and locations at which the Work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

ARTICLE 16

Buy American Steel And Manufactured Products For Construction Contracts (Jan 1991)

- A. The Contractor agrees that only domestic steel and manufactured products will be used by the Contractor, subcontractors, materialmen and suppliers in the performance of this contract, as defined in (b) below.
- B. The following terms apply to this clause:
 1. **Steel and manufactured products.**
As used in this clause, steel and manufactured products include (1) those produced in the United States or (2) a manufactured product produced in the United States, if the cost of its components mined, produced or manufactured in the United States exceeds 60 percent of the cost of all its components and final assembly has taken place in the United States.
 2. **Components.**
As used in this clause, components means those articles, materials and supplies incorporated directly into steel and manufactured products.

3. Cost of components.

This means the costs for production of the components, exclusive of final assembly labor costs.

ARTICLE 17

Energy Conservation Requirements

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency that is contained in the state energy conservation plan issued in compliance with the Energy Policy and conservation Act (Public Law 94-163).

ARTICLE 18

Lobbying and Influencing Federal Employees

1. No Federal appropriated funds shall be paid, by or on behalf of the Contractor, 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 the making of any Federal grant and the Amendment or modification of any Federal grant.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any Federal grant, the Contractor shall complete and submit Standard Form-LLL, "Disclosure of Lobby Activities," in accordance with its instructions.

ARTICLE 19

General and Labor Clauses for all Construction Contracts and Subcontracts.

1. A.I.P. Project

The work in this contract is included in A.I.P. Project No. 3-35-0016-039-2016, which is being undertaken and accomplished by the City of Farmington in accordance with the Terms and Conditions of a Grant Agreement between the City of Farmington and the United States, under the Airport and Airway Improvement Act of 1982 and FAR Part 152 (14 CFR Part 152), pursuant to which the United States has agreed to pay a certain percentage of the costs of the Project that are determined to be allowable Project Costs under that Act. The United States is not a party to this Contract and no reference in this Contract to the FAA or any representative thereof, or to any rights granted to the FAA or any representative thereof, or the United States by the Contract, makes the United States a party to this Contract.

2. Consent to Assignment

The Contractor shall obtain the prior written consent of the Sponsor to any proposed assignment of any interest in or part of this Contract.

3. Convict Labor

No convict labor may be employed under this Contract.

ARTICLE 20

Hold Harmless

All Contractors or Subcontractors performing work under this Agreement agree to hold harmless, indemnify and defend, the City of Farmington and the Engineer, their consultants and each of their officers, agents and employees from any and all liability claims, losses or damage arising out of or alleged to arise from the Contractor's (or Subcontractor's) negligence in the performance of the Work described in the Construction Contract Documents, but not including liability that may be due to the sole negligence of the City of Farmington, the Engineer, their consultants or their officers, agents and employees.

ARTICLE 21

Additional Federal Standards

All contracts and subcontracts that result from this solicitation incorporate the following provisions by reference, with the same force and effect as if given in full text. The contractor has full responsibility to monitor compliance to the referenced statute or regulation. The contractor must address any claims or disputes that pertain to a referenced requirement directly with the Federal Agency with enforcement responsibilities.

Requirement	Federal Agency with Enforcement Responsibilities
Federal Fair Labor Standards Act (29 USC 201)	U.S. Department of Labor – Wage and Hour Division
Occupational Safety and Health Act of 1970 (20 CFR Part 1910)	U.S. Department of Labor – Occupational Safety and Health Administration

ARTICLE 22

Texting When Driving – Executive Order 13513, and DOT Order 3902.10

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

The Contractor must promote policies and initiatives for employees and other work personnel that decrease crashes by distracted drivers, including policies to ban text messaging while driving. The Contractor must include these policies in each third party subcontract involved on this project

ARTICLE 23

Agreement Binding

The Sponsor and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contract Documents constitute the entire agreement between the Sponsor and the Contractor and may only be altered, amended or repealed by a duly executed written instrument. Neither the Sponsor nor the Contractor shall, without the prior written consent of the other, assign or sublet in whole or in part his interest under any of the Contract Documents and specifically, the Contractor shall not assign any moneys due or to become due without the prior written consent of the Sponsor.

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GENERAL PROVISIONS

GENERAL PROVISIONS	67 Pages
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<i>Nuclear Gages</i>	

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GENERAL PROVISIONS

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:

10-01 AASHTO. The American Association of State Highway and Transportation Officials, the successor association to AASHO.

10-02 ACCESS ROAD. The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public highway.

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 AIP. The Airport Improvement Program, a grant-in-aid program, administered by the Federal Aviation Administration.

10-05 AIR OPERATIONS AREA. For the purpose of these specifications, the term air operations area 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.

10-06 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; and airport buildings and facilities located in any of these areas, and includes a heliport.

10-07 ASTM. The American Society for Testing and Materials.

10-08 AWARD. The acceptance, by the Owner, of the successful bidder's proposal.

10-09 BIDDER. Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.

10-10 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.

10-11 CALENDAR DAY. Every day shown on the calendar.

10-12 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 the work affected by such changes. The work, covered by a change order, shall be within the scope of the contract.

10-13 CONTRACT. The written agreement covering the work to be performed. The awarded contract shall include, but is not limited to: The Advertisement; The Contract Form; The Proposal; The Performance Bond; The Payment Bond; any required insurance certificates; The Specifications; The Plans, and any addenda issued to bidders.

10-14 CONTRACT ITEM (PAY ITEM). A specific unit of work for which a price is provided in the contract.

10-15 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.

10-16 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.

10-17 DRAINAGE SYSTEM. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

10-18 ENGINEER. The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering inspection of the contract work and acting directly or through an authorized representative.

10-19 EQUIPMENT. All machinery, together with the necessary supplies for upkeep and maintenance, and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.

10-20 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 Engineer to be necessary to complete the work within the intended scope of the contract as previously modified.

10-21 FAA. The Federal Aviation Administration of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or his/her duly authorized representative.

10-22 FEDERAL SPECIFICATIONS. The Federal Specifications and Standards, Commercial Item Descriptions, and supplements, amendments, and indices thereto are prepared and issued by the General Services Administration of the Federal Government.

10-23 FORCE ACCOUNT. Force account construction work is construction that is accomplished through the use of material, equipment, labor, and supervision provided by the Owner or by another public agency pursuant to an agreement with the Owner.

10-24 INSPECTOR. An authorized representative of the Engineer assigned to make all necessary inspections and/or tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

10-25 INTENTION OF TERMS. Whenever, in these specifications or on the plans, the words ``directed," ``required," ``permitted," ``ordered," ``designated," ``prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer 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, subject in each case to the final determination of the Owner.

Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

10-26 LABORATORY. The official testing laboratories of the Owner or such other laboratories as may be designated by the Engineer.

10-27 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.

10-28 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 percent of the total amount of the award contract. All other items shall be considered minor contract items.

10-29 MATERIALS. Any substance specified for use in the construction of the contract work.

10-30 NOTICE TO PROCEED. 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.

10-31 OWNER. The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. For AIP contracts, the term "sponsor" shall have the same meaning as the term "Owner." Where the term "Owner" is capitalized in this document, it shall mean airport owner or sponsor only.

10-32 PAVEMENT. The combined surface course, base course, and subbase course, if any, considered as a single unit.

10-33 PAYMENT BOND. The approved form of security furnished by the Contractor and his/her surety as a guaranty that he will pay in full all bills and accounts for materials and labor used in the construction of the work.

10-34 PERFORMANCE BOND. The approved form of security furnished by the Contractor and his/her surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

10-35 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.

10-36 PROJECT. The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

10-37 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.

10-38 PROPOSAL GUARANTY. The security furnished with a proposal to guarantee that the bidder will enter into a contract if his/her proposal is accepted by the Owner.

10-39 RUNWAY. The area on the airport prepared for the landing and takeoff of aircraft.

10-40 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.

10-41 SPONSOR. See definition above of "Owner."

10-42 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; flexible and rigid pavements; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

10-43 SUBGRADE. The soil that forms the pavement foundation.

10-44 SUPERINTENDENT. The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the Engineer, and who shall supervise and direct the construction.

10-45 SUPPLEMENTAL AGREEMENT. A written agreement between the Contractor and the Owner covering (1) work that would increase or decrease the total amount of the awarded contract, or any major contract item, by more than 25 percent, such increased or decreased work being within the scope of the originally awarded contract; or (2) work that is not within the scope of the originally awarded contract.

10-46 SURETY. The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.

10-47 TAXIWAY. For the purpose of this document, the term taxiway means the portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways or aircraft parking areas.

10-48 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.

10-49 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 6 hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work, requiring the presence of an inspector, will be considered as working days.

END OF SECTION 10

SECTION 20 PROPOSAL REQUIREMENTS AND CONDITIONS

20-01 ADVERTISEMENT (Notice to Bidders).

This Project has been advertised on June 18 and July 2, 2017.

20-02 PREQUALIFICATION OF BIDDERS. Each bidder shall furnish the owner satisfactory evidence of his/her competency to perform the proposed work. Such evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, a list of equipment that would be available for the work, and a list of key personnel that would be available. In addition, each bidder shall furnish the owner satisfactory evidence of his/her financial responsibility. Such 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 Contractor'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 his/her 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 his/her (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 he is prequalified with the State Highway Division and is on the current "bidder's list" of the state in which the proposed work is located. Such evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports hereinbefore specified.

Each bidder shall submit "evidence of competency" and "evidence of financial responsibility" to the Owner at the time of bid opening.

20-03 CONTENTS OF PROPOSAL FORMS. The Owner shall furnish bidders with proposal forms. All papers bound with or attached to the proposal forms are necessary parts and must not be detached.

The plans specifications, and other documents designated in the proposal form shall be considered a part of the proposal whether attached or not.

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. Contractor default under previous contracts with the Owner.
- d. 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 subsection titled ALTERATION OF WORK AND QUANTITIES of Section 40 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. He shall satisfy himself 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 he may make or obtain from his/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/her proposal on the forms furnished by the Owner. All blank spaces in the proposal forms 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 for which he proposes to do 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 sign his/her proposal correctly and in ink. If the proposal is made by an individual, his/her 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 under the laws of which 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 his/her authority to do so and that the signature is binding upon the firm or corporation.

20-08 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.

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.

20-09 BID GUARANTEE. Each separate proposal shall be accompanied by a certified check, or other specified acceptable collateral, in the amount specified in the proposal form. Such check, or collateral, shall be made payable to the Owner.

20-10 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 before the time specified for opening all bids. Proposals received after the bid opening time shall be returned to the bidder unopened.

20-11 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 or by telegram 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.

20-12 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.

20-13 DISQUALIFICATION OF BIDDERS. A bidder shall be considered disqualified for any of the following reasons:

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

b. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.

c. If the bidder is considered to be in "default" for any reason specified in the subsection titled ISSUANCE OF PROPOSAL FORMS of this section.

END OF SECTION 20

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SECTION 30 AWARD AND EXECUTION OF CONTRACT

30-01 CONSIDERATION OF PROPOSALS. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit 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 subsection titled IRREGULAR PROPOSALS of Section 20.

b. If the bidder is disqualified for any of the reasons specified in the subsection titled DISQUALIFICATION OF BIDDERS of Section 20.

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 ninety (90) calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

Award of the contract shall be made by the Owner to the lowest, qualified bidder whose proposal conforms to the cited requirements of the Owner.

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 subsection titled APPROVAL OF CONTRACT of this section.

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 hereinbefore specified in the subsection titled CONSIDERATION OF PROPOSALS of this section. 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 contracts bonds as specified in the subsection titled REQUIREMENTS OF CONTRACT BONDS of this section.

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 such signed contract to the owner, along with the fully executed surety bond or bonds specified in the subsection titled REQUIREMENTS OF CONTRACT BONDS of this section, within **10** calendar days from the date mailed or otherwise delivered to the successful bidder. If the contract is mailed, special handling is recommended.

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 **10** calendar day period specified in the subsection titled REQUIREMENTS OF CONTRACT BONDS 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 and shall have the right to make such alterations in the work as may be necessary or desirable to complete the work originally intended in an acceptable manner. Unless otherwise specified herein, the Engineer shall be and is hereby authorized to make such alterations in the work as may increase or decrease the originally awarded contract quantities, provided that the aggregate of such alterations does not change the total contract cost or the total cost of any major contract item by more than 25 percent (total cost being based on the unit prices and estimated quantities in the awarded contract). Alterations that do not exceed the 25 percent limitation shall not invalidate the contract nor release the surety, and the Contractor agrees to accept payment for such alterations as if the altered work had been a part of the original contract. These alterations that are for work within the general scope of the contract shall be covered by "Change Orders" issued by the Engineer. Change orders for altered work shall include extensions of contract time where, in the Engineer's opinion, such extensions are commensurate with the amount and difficulty of added work.

Should the aggregate amount of altered work exceed the 25 percent limitation hereinbefore specified, such excess altered work shall be covered by supplemental agreement. 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.

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

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

40-03 OMITTED ITEMS. The Engineer may, in the Owner's best interest, omit from the work any contract item, except major contract items. 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 nonperformed, 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 the subsection titled PAYMENT FOR OMITTED ITEMS of Section 90.

40-04 EXTRA WORK. Should acceptable completion of the contract require the Contractor to perform an item of work for which no basis of payment has been provided in the original contract or previously issued change orders or supplemental agreements, the same shall be called "Extra Work." Extra Work that is within the general scope of the contract shall be covered by written change order. Change orders for such Extra Work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the Engineer's opinion, is necessary for completion of such Extra Work.

When determined by the Engineer to be in the Owner's best interest, he may order the Contractor to proceed with Extra Work by force account as provided in the subsection titled PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK of Section 90.

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 hereinbefore defined in the subsection titled SUPPLEMENTAL AGREEMENT of Section 10.

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. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas of the airport with respect to his/her own operations and the operations of all his/her subcontractors as specified in the subsection titled LIMITATION OF OPERATIONS of Section 80. 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 subsection titled CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS in Section 70.

With respect to his/her own operations and the operations of all his/her 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.

When the contract requires the maintenance of vehicular traffic on an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep such road, street, or highway open to all traffic and shall provide such maintenance as may be required to accommodate traffic. The Contractor shall furnish erect, and maintain barricades, warning signs, flagperson, and other traffic control devices in reasonable conformity with the manual of Uniform Traffic Control Devices for Streets and Highways (published by the United States Government Printing Office), unless otherwise specified herein. 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.

The Contractor shall make his/her own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of aircraft and vehicular traffic as specified in this subsection.

The cost of maintaining the aircraft and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be included in the various contract items.

40-06 REMOVAL OF EXISTING STRUCTURES. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Engineer shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the Engineer in accordance with the provisions of the contract.

Except as provided in the subsection titled RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK of this section, 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 utilized in the work as otherwise provided for in the contract and shall remain the property of the Owner when so utilized 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 either embankment or waste, he may at his/her option either:

- a. Use such material in another contract item, providing such use is approved by the Engineer and is in conformance with the contract specifications applicable to such use; or,
- b. Remove such material from the site, upon written approval of the Engineer; or
- c. Use such material for his/her 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., he shall request the Engineer's approval in advance of such use.

Should the Engineer approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at his/her own 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 his/her use of such material so used in the work or removed from the site.

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

It is understood and agreed that the Contractor shall make no claim for delays by reason of his/her 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.

40-09 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. He 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

SECTION 50 CONTROL OF WORK

50-01 AUTHORITY OF THE ENGINEER. The Engineer shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, and as to the manner of performance and rate of progress of the work. The Engineer shall decide all questions that may arise as to the interpretation of the specifications or plans relating to the work. The Engineer shall determine the amount and quality of the several kinds of work performed and materials furnished which are to be paid for the under contract.

The Engineer does not have the authority to accept pavements that do not conform to FAA specification requirements.

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

If the Engineer finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications but that the portion of the work affected will, in his/her opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, he will advise the Owner of his/her determination that the affected work be accepted and remain in place. In this event, the Engineer will document his/her 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. The Engineer's determination and recommended contract price adjustments will be based on good engineering judgment and such tests or retests of the affected work as are, in his/her opinion, needed. Changes in the contract price shall be covered by contract modifications (change order or supplemental agreement) as applicable.

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

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

For the purpose of this subsection, the term "reasonably close conformity" is also intended to provide the Engineer with the authority, after consultation with the FAA, to use good engineering judgment in his/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 Engineer will not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

50-03 COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. 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 FAA advisory circulars; contract general provisions shall govern over plans, cited standards for materials or testing, and cited FAA advisory circulars; plans shall govern over cited standards for materials or testing and cited FAA advisory circulars. 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 standards for testing occur due to the timing of changing, editing, and replacing of standards. In the event the Contractor discovers any apparent discrepancy within standard test methods, he shall immediately call upon the Engineer for his/her 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, he shall immediately call upon the Engineer for his/her interpretation and decision, and such decision shall be final.

The Special Provisions can be found following the Technical Specifications of this Specification book.

50-04 COOPERATION OF CONTRACTOR. The Contractor will be supplied with five copies each of the plans and specifications. He shall have available on the work at all times one copy each of the plans and specifications. Additional 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 he shall cooperate with the Engineer and his/her 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 his/her agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the Engineer or his/her authorized representative.

50-05 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 his/her work so as 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 his/her 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 by him because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange his/her work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project. He shall join his/her 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 shall establish horizontal and vertical control only. The Contractor must establish all layout required for the construction of the work. Such stakes and markings as the Engineer may set for either his/her own or the Contractor's guidance shall be preserved by the Contractor. In case of negligence on the part of the Contractor, or his/her employees, resulting in the destruction of such stakes or markings, an amount equal to the cost of replacing the same may be deducted from subsequent estimates due the Contractor at the discretion of the Engineer.

The Contractor will be required to furnish all lines, grades and measurements from the control points necessary for the proper prosecution and control of the work contracted for under these specifications.

The Contractor must give weekly copies of the survey notes to the Engineer so that the Engineer may check them as to accuracy and method of staking. All areas that are staked by the Contractor must be checked by the Engineer prior to beginning any work in the area. The Engineer will make periodic checks of the grades and alignment set by the Contractor. In case of error on the part of the Contractor, or his/her employees, resulting in establishing grades and/or alignment that are not in accordance with the plans or established by the Engineer, all construction not in accordance with the established grades and/or alignment shall be replaced without additional cost to the Owner.

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

Construction Staking and Layout includes but is not limited to:

Clearing and Grubbing perimeter staking.

Rough Grade slope stakes at 100-foot stations.

Drainage Swales slope stakes and flow line blue tops at 50-foot stations.

Subgrade blue tops at 25 foot stations and 25 foot offset distance (max.) for the following section locations:

- a. Runway – minimum 5 per station
- b. Taxiways – minimum 3 per station
- c. Holding apron areas – minimum 3 per station
- d. Roadways – minimum 3 per station

Base Course blue tops at 25 foot stations and 25 foot offset distance (max.) for the following section locations:

- a. Runway – minimum 5 per station
- b. Taxiways – minimum 3 per station
- c. Holding apron areas – minimum 3 per station

Pavement areas:

- a. Edge of Pavement hubs and tacks (for stringline by Contractor) at 100 foot stations
- b. Between Lifts at 25 foot stations for the following section locations:
 - (1). Runways – each paving lane width
 - (2). Taxiways – each paving lane width
 - (3). Holding areas – each paving lane width
- c. After finish paving operations at 50 foot stations
 - (1). All paved areas – Edge of each paving lane prior to next paving lot
- d. Shoulder and safety area blue tops at 50 foot stations and at all break points with maximum of 50 foot offsets

Fence lines at 100 foot stations

Electrical and Communications System locations, lines and grades including but not limited to duct runs, connections, fixtures, signs, lights, VASI's, PAPI's, REIL's, Wind Cones, Distance Markers (signs), pull boxes and manholes.

Drain lines, cut stakes and alignment on 25-foot stations, inlet and manholes.

Painting and Striping layout (pinned with 1.5 inch PK nails) marked for paint Contractor.
(All nails shall be removed after painting)

Laser, or other automatic control devices, shall be checked with temporary control point or grade hub at a minimum of once per 400 feet per pass (i.e. paving lane).

NOTE: Controls and stakes disturbed or suspect of having been disturbed shall be checked and/or reset as directed by the Engineer without additional cost to the Owner.

50-07 AUTOMATICALLY CONTROLLED EQUIPMENT. Whenever batching or mixing plant equipment is required to be operated automatically under the contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for a period 48 hours following the breakdown or malfunction, provided this method of operations will produce results which conform to all other requirements of the contract.

50-08 AUTHORITY AND DUTIES OF INSPECTORS. Inspectors employed by the Owner shall be authorized to inspect all work done and all material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. Inspectors are not authorized to revoke, alter, or waive any provision of the contract. Inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

Inspectors employed by the Owner are authorized to notify the Contractor or his/her representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the Engineer for his/her decision.

50-09 INSPECTION OF THE WORK. All materials and each part or detail of the work shall be subject to inspection by the Engineer. The Engineer shall be allowed access to all parts of the

work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

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

Any work done or materials used without supervision or inspection by an authorized representative of the Owner may be ordered removed and replaced at the Contractor's expense unless the Owner's representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.

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.

The Engineer or Inspectors employed by the Owner are not responsible as a result of site visits and/or inspections of the Contractor's work in progress for supervising, directing or having control over the Contractor's Work nor are the Engineer or Inspectors employed by the Owner responsible for the means, methods, techniques, sequences or procedures of construction selected by the Contractor.

50-10 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the Engineer as provided in the subsection titled CONFORMITY WITH PLANS AND SPECIFICATIONS of this section.

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 the subsection titled CONTRACTOR'S RESPONSIBILITY FOR WORK OF Section 70.

No removal work made under provision of this subsection shall be done without lines and grades having been given by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans or as given, 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 forthwith with any order of the Engineer made under the provisions of this subsection, the Engineer will have authority to cause unacceptable work to be remedied or removed and replaced and unauthorized work to be

removed and to deduct the costs (incurred by the Owner) from any monies due or to become due 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 shall be responsible for all damage done by his/her hauling equipment and shall correct such damage at his/her own expense.

50-12 MAINTENANCE DURING CONSTRUCTION. The Contractor shall maintain the work during construction and until the work is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

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 the subsection titled MAINTENANCE DURING CONSTRUCTION of this section, the Engineer shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

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

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

50-15 FINAL ACCEPTANCE. Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be completed in accordance with the

contract, plans, and specifications, such inspection shall constitute the final inspection. The Engineer shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instructions for correction of same and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

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

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

END OF SECTION 50

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SECTION 60 CONTROL OF MATERIALS

60-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS. The materials used on 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 complete statements to the Engineer as to the origin, composition, and manufacture of all materials to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the Engineer's option, materials may be approved at the source of supply before delivery is stated. 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 conforms to the requirements of cited materials specifications. In addition, where an FAA specification for airport lighting equipment is cited in the plans or specifications, the Contractor shall furnish such equipment that is:

- a. Listed in FAA Advisory Circular (AC) 150/5345-53, Airport Lighting Equipment Certification Program and Addendum, that is in effect on the date of advertisement; and,
- b. Produced by the manufacturer as listed in the Addendum cited above certified equipment part number.

The following airport lighting equipment is required for this contract and is to be furnished by the Contractor in accordance with the requirements of this subsection:

See Technical Specifications and Construction Safety and Phasing Plan

60-02 SAMPLES, TESTS, AND CITED SPECIFICATIONS. Unless otherwise designated, all materials used in the work shall be inspected and approved by the Engineer before incorporation in the work. Any work in which untested materials are used without approval or written permission of the Engineer shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the Engineer, shall be removed at the Contractor's expense. Unless otherwise designated, tests in accordance with the cited standard methods of ASTM, AASHTO, Federal Specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids, will be made by and at the expense of the Engineer. The testing organizations performing on site field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel, including the Contractor's representative at his/her request. Unless otherwise designated, samples will be taken by a qualified representative of the Engineer. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at his/her request.

The Contractor shall employ a testing organization to perform all Contractor required tests. The Contractor shall submit to the Engineer resumes on all testing organizations and individual

persons who will be performing the tests. The Engineer will determine if such persons are qualified. All the test data shall be reported to the Engineer after the results are known. A legible, handwritten copy of all test data shall be given to the Engineer daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the Engineer showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

60-03 CERTIFICATION OF COMPLIANCE. The Engineer may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's certificates of compliance 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.

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

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

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "brand name," 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.

Should the Contractor propose to furnish an "or equal" material or assembly, he shall furnish the manufacturer's certificates of compliance as hereinbefore described for the specified brand name material or assembly. However, the Engineer shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

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

60-04 PLANT INSPECTION. The Engineer or his/her 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 his/her acceptance of the material or assembly.

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

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

b. The Engineer shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

c. If required by the Engineer, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Office or working space should be conveniently located with respect to the plant.

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

60-05 ENGINEER'S FIELD OFFICE. The Contractor shall furnish for the duration of the project one building for the use of the field engineers and inspectors, as a field office. This facility shall be an approved weatherproof building meeting the current State Highway Specifications (for example, Class I Field Office or Type C Structure). This building shall be located conveniently near to the construction and shall be separate from any building used by the Contractor. A land line telephone and answering machine shall be provided. The Contractor shall be responsible for payment of the basic monthly charge and local calls only. Any Long Distance Tolls shall be the responsibility of the caller. The Contractor shall furnish [photocopy machine, water, sanitary facilities, heat, air conditioning, electricity, a cell phone with 600 long distance minutes per month and voice mail]. Fax machine and line OR scanner and ability to transmit electronic media shall be furnished. No direct payment will be made for this building or labor, materials, ground rental, or other expense in connection therewith. The cost hereof shall be included in the price bid for the various items of the contract. The Contractor and his/her superintendent shall provide all reasonable facilities to enable to the Engineer to inspect the workmanship and materials entering into the work.

60-06 STORAGE OF MATERIALS. Materials shall be so stored as 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 so as to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the Engineer. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the Engineer. Private property shall not be used for storage purposes without written permission of the owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the Engineer a copy of the property owner's permission.

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

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

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

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

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

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

END OF SECTION 60

SECTION 70 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

70-01 LAWS TO BE OBSERVED. The Contractor shall keep fully informed of all Federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. He 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 his/her 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 himself or his/her 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 prosecution 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, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the surety shall indemnify and save 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 prosecution 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) is indicated as follows:

No work outside this contract is anticipated during construction.

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

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

70-05 FEDERAL AID PARTICIPATION. For AIP contracts, the United States Government has agreed to reimburse the Owner for some portion of the contract costs. Such reimbursement is made from time to time upon the Owner's request to the FAA. In consideration of the United States Government's (FAA's) agreement with the Owner, the Owner has included provisions in this contract pursuant to the requirements of Title 49 of the United States Code (USC) and the Rules and Regulations of the FAA that pertain to the work.

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

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

70-06 SANITARY, HEALTH, AND SAFETY PROVISIONS. The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his/her employees as may be necessary to comply with the requirements of the state and local Board of Health, or of other bodies or tribunals having jurisdiction.

Attention is directed to Federal, state, and local laws, rules and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to his/her health or safety.

Representatives of the Owner or the Engineer are not responsible during site visits or as a result of observations or inspections of the Contractor's work in progress for any safety precautions or programs incident to the Work of the Contractor or for any failure of the Contractor to comply with laws, rules, regulations, ordinances, codes or orders applicable to safety precautions or programs.

70-07 PUBLIC CONVENIENCE AND SAFETY. The Contractor shall control his/her operations and those of his/her 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 his/her own operations and those of his/her subcontractors and all suppliers in accordance with the subsection titled MAINTENANCE OF TRAFFIC of Section 40 hereinbefore specified and shall limit such operations for the convenience and safety of the traveling public as specified in the subsection titled LIMITATION OF OPERATIONS of Section 80 hereinafter.

70-08 BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS. The Contractor shall furnish, erect, and maintain all barricades, warning signs, and markings for hazards necessary to protect the public and the work. When used during periods of darkness, such barricades, warning signs, and hazard markings shall be suitably illuminated. Unless otherwise specified, barricades, warning signs, and markings for hazards that are in the air operations area shall be a maximum of 18 inches high. Unless otherwise specified, barricades shall be spaced not more than 25 feet apart. Barricades, warning signs, and markings shall be paid for under Section 40-05.

For vehicular and pedestrian traffic, the Contractor shall furnish, erect, and maintain barricades, warning signs, lights and other traffic control devices in reasonable conformity with the Manual of Uniform Traffic Control Devices for Streets and Highways (latest edition) (published by the United States Government Printing Office).

When the work requires closing an air operations area of the airport or portion of such area, the Contractor shall furnish, erect, and maintain temporary markings and associated lighting conforming to the requirements of AC 150/5340-1, Standards for Airport Markings (latest edition).

The Contractor shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stock piles, and his/her parked construction equipment that may be hazardous to the operation of emergency fire-rescue or maintenance vehicles on the airport in reasonable conformance to AC 150/5370-2, Operational Safety on Airports During Construction (latest edition).

The Contractor shall identify each motorized vehicle or piece of construction equipment in reasonable conformance to AC 150/5370-2 (latest edition).

The Contractor shall furnish and erect all barricades, warning signs, and markings for hazards prior to commencing work that requires such erection and shall maintain the barricades, warning signs, and markings for hazards until their dismantling is directed by the Engineer.

Open-flame type lights shall not be permitted within the air operations areas of the airport.

70-09 USE OF EXPLOSIVES. When the use of explosives is necessary for the prosecution of the work, the Contractor shall exercise the utmost care not to endanger life or property, including new work. The Contractor shall be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner in compliance with all laws and ordinances, and all such storage places shall be clearly marked. Where no local laws or ordinances apply, storage shall be provided satisfactory to the Engineer and, in general, not closer than 1,000 feet (300 m) from the work or from any building, road, or other place of human occupancy.

The Contractor shall notify each property owner and public utility company having structures or facilities in proximity to the site of the work of his/her intention to use explosives. Such notice shall be given sufficiently in advance to enable them to take such steps as they may deem necessary to protect their property from injury.

The use of electrical blasting caps shall not be permitted on or within 1,000 feet (300 m) of the airport property.

70-10 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his/her

manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have 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 nonexecution thereof by the Contractor, he shall restore, at his/her 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 he shall make good such damage or injury in an acceptable manner.

70-11 RESPONSIBILITY FOR DAMAGE CLAIMS. The Contractor shall indemnify and save harmless the Engineer and the Owner and their officers, 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 his/her contract as may be considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, his/her surety may be held until such suit(s), action(s), or claim(s) for injuries or damages as aforesaid 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 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 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. Should it be 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 shall be specified herein and indicated on the plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified. The Contractor shall make his/her own estimate of the difficulties involved in arranging his/her work to permit such beneficial occupancy by the Owner as described below:

Work to be performed in the safety area of Runway 5/23 or Runway 7/25 shall be completed during runway closure. At least one runway shall be open at given time during the project. See Construction Safety and Phasing Plan for construction phasing and runway closure information.

Upon completion of any portion of the work listed above, such portion shall be accepted by the Owner in accordance with the subsection titled PARTIAL ACCEPTANCE of Section 50.

No portion of the work may be opened by the Contractor for public use until ordered by the Engineer in writing. Should it become necessary to open a portion of the work to public traffic

on a temporary or intermittent basis, such openings shall be made when, in the opinion of the Engineer, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at his/her expense.

The Contractor shall make his/her 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.

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

Contractor shall refer to the approved safety plan to identify barricade requirements and other safety requirements prior to opening up sections of work to traffic.

70-14 CONTRACTOR'S RESPONSIBILITY FOR WORK. Until the Engineer's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with the subsection titled PARTIAL ACCEPTANCE of Section 50, 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 his/her 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, seedings, and soddings furnished under his/her 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 the subsection titled RESTORATION OF SURFACES DISTURBED BY OTHERS of this section, 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 his/her 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 the owners are indicated as follows:

New Mexico One Call, Inc.
(800) 321-2537

FAA Airways Facilities
Pat Morton
575-347-5500

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 his/her 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 his/her plan of operations. Such notification shall be in writing addressed to THE PERSON TO CONTACT as provided hereinbefore in this subsection and the subsection titled RESTORATION OF SURFACES DISTURBED BY OTHERS of this section. A copy of each notification shall be given to the Engineer.

In addition to the general written notification hereinbefore provided, it shall be the responsibility of the Contractor to keep such individual owners advised of changes in his/her plan of operations that would affect such owners.

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

The Contractor's failure to give the two day's notice hereinabove provided 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 excavation methods acceptable to the Engineer within 3 feet (90 cm) 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, he shall immediately notify the proper authority and the Engineer and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the Engineer continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to his/her operations whether or not 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 his/her surety.

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

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall notify the above named FAA Airway Facilities Point-of-Contact seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If prosecution of the project work requires a facility outage, the Contractor shall contact the above named FAA Point-of-Contact a minimum of 48 hours prior to the time of the required outage.

d. If prosecution of the project work results in damages to existing FAA equipment or cables, the Contractor shall repair the damaged item in conformance with FAA Airway Facilities' standards to the satisfaction of the above named FAA Point-of-Contact.

e. If the project work requires the cutting or splicing of FAA owned cables, the above named FAA Point-of-Contact shall be contacted a minimum of 48 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA Airway Facilities representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA Airway Facilities' specifications and require approval by the above named FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA Airway Facilities restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA Airway Facilities, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 FURNISHING RIGHTS-OF-WAY. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 PERSONAL LIABILITY OF PUBLIC OFFICIALS. In carrying out any of the contract provisions or in exercising any power or authority granted to him by this contract, there shall be no liability upon the Engineer, his/her 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/her surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill his/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. He shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, 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/her operations, any building, part of a building, structure, or object that is incongruous with its surroundings, he 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 his/her 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 modification (change order or supplemental agreement) as provided in the subsection titled EXTRA WORK of Section 40 and the subsection titled PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT WORK of Section 90. If appropriate, the contract modification shall include an extension of contract time in accordance with the subsection titled DETERMINATION AND EXTENSION OF CONTRACT TIME of Section 80.

END OF SECTION 70

SECTION 80 PROSECUTION AND PROGRESS

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

Should the Contractor elect to assign his/her 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. In case of approval, the Contractor shall file copies of all subcontracts with the Engineer.

The Contractor shall perform, with his organization, an amount of work equal to at least 25 percent of the total contract cost.

80-02 NOTICE TO PROCEED. The notice to proceed shall state the date on which it is expected the Contractor will begin the construction and from which date contract time will be charged. The Contractor shall begin the work to be performed under the contract within 10 days of the date set by the Engineer in the written notice to proceed, but in any event, the Contractor shall notify the Engineer at least 24 hours in advance of the time actual construction operations will begin.

80-03 PROSECUTION AND PROGRESS. Unless otherwise specified, the Contractor shall submit his/her progress schedule for the Engineer's approval within 10 days after the effective date of the notice to proceed. The Contractor's progress schedule, when approved by the Engineer, may be used to establish major construction operations and to check on the progress of the work. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

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

For AIP contracts, the Contractor shall not commence any actual construction prior to the date on which the notice to proceed is issued by the Owner.

80-04 LIMITATION OF OPERATIONS. The Contractor shall control his/her operations and the operations of his/her subcontractors and all suppliers so as to provide for the free and unobstructed movement of aircraft in the AIR OPERATIONS AREAS of the airport.

When the work requires the Contractor to conduct his/her operations within an AIR OPERATIONS AREA of the airport, the work shall be coordinated with airport operations (through the Engineer) at least 48 hours prior to commencement of such work. The Contractor shall not close an AIR OPERATIONS AREA until so authorized by the Engineer and until the necessary temporary marking and associated lighting is in place as provided in the subsection titled BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS of Section 70.

When the contract work requires the Contractor to work within an AIR OPERATIONS AREA (AOA) of the airport on an intermittent basis (intermittent opening and closing of the AIR OPERATIONS AREA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the AIR OPERATIONS AREA; immediately obey all instructions to resume work in such AIR OPERATIONS AREA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AIR OPERATIONS AREA until the satisfactory conditions are provided. The following AIR OPERATIONS AREA 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: Runway 5/23

TIME PERIODS AOA CAN BE CLOSED: Twenty Calendar Days (10 calendar days for Schedule I and 10 calendar days for Schedule IV)

AOA: Runway 7/25

TIME PERIODS AOA CAN BE CLOSED: Twenty Calendar Days (10 calendar days for Schedule II and 10 calendar days for Schedule IV)

TYPE OF COMMUNICATIONS REQUIRED WHEN WORKING IN AN AOA: Radio contact with Airport Aeronautical Advisory Stations (UNICOM/CTAF).

CONTROL AUTHORITY: Four Corners Regional Airport Air Traffic Control Tower

Contractor shall be required to conform to safety standards contained in AC 150/5370-2, 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 project safety plan and the provisions set forth within the current version of Advisory Circular 150/5370-2. The safety plan included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a plan that details how it proposes to comply with the requirements presented within the safety plan.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks of the safety plan measures 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 safety plan and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved safety plan unless approved in writing by the Owner or Engineer.

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 and, in the opinion of the Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed forthwith by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without approval of the Engineer.

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

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall be such that no injury to previously completed work, adjacent property, or existing airport facilities will result from 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 others are authorized by the Engineer. If the Contractor desires to use a method or type of equipment other than specified in the contract, he may request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this subsection.

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 as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the prosecution of the work, or for such time as is 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 Engineer's order to suspend work to the effective date of the Engineer's order to resume the work. Claims for such compensation shall be filed with the Engineer within the time period stated in the Engineer's order to resume work. The Contractor shall submit with his/her claim information substantiating the amount shown on the claim. The Engineer will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be

construed as entitling the Contractor to compensation for delays due to inclement weather, for suspensions made at the request of the Owner, or for any other delay provided for in the contract, plans, or specifications.

If it should become 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. He 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 or working days allowed for completion of the work shall be stated in the proposal and contract and shall be known as the CONTRACT TIME.

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

a. CONTRACT TIME based on WORKING DAYS shall be calculated weekly by the Engineer. The Engineer will furnish the Contractor a copy of his/her weekly statement of the number of working days charged against the contract time during the week and the number of working days currently specified for completion of the contract (the original contract time plus the number of working days, if any, that have been included in approved CHANGE ORDERS or SUPPLEMENTAL AGREEMENTS covering EXTRA WORK).

The Engineer shall base his/her weekly statement of contract time charged on the following considerations:

(1) No time shall be charged for days on which the Contractor is unable to proceed with the principal item of work under construction at the time for at least 6 hours with the normal work force employed on such principal item. Should the normal work force be on a double-shift, 12 hours shall be used. Should the normal work force be on a triple-shift, 18 hours shall apply. Conditions beyond the Contractor's control such as strikes, lockouts, unusual delays in transportation, temporary suspension of the principal item of work under construction or temporary suspension of the entire work which have been ordered by the Owner for reasons not the fault of the Contractor, shall not be charged against the contract time.

(2) The Engineer will not make charges against the contract time prior to the effective date of the notice to proceed.

(3) The Engineer will begin charges against the contract time on the first working day after the effective date of the notice to proceed.

(4) The Engineer will not make charges against the contract time after the date of final acceptance as defined in the subsection titled FINAL ACCEPTANCE of Section 50.

(5) The Contractor will be allowed 1 week in which to file a written protest setting forth his/her objections to the Engineer's weekly statement. If no objection is filed within such specified time, the weekly statement shall be considered as acceptable to the Contractor.

The contract time (stated in the proposal) is based on the originally estimated quantities as described in the subsection titled INTERPRETATION OF ESTIMATED PROPOSAL QUANTITIES of Section 20. Should the satisfactory completion of the contract require

performance of work in greater quantities than those estimated in the proposal, 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 contract time shall not consider either the cost of work or the extension of contract time that has been covered by change order or supplemental agreement and shall be made at the time of final payment.

b. 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 nonwork 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.

c. When the contract time is a specified completion date, it shall be the date on which all contract work shall be substantially completed.

If the Contractor finds it impossible for reasons beyond his/her control to complete the work within the contract time as specified, or as extended in accordance with the provisions of this subsection, he may, at any time prior to the expiration of the contract time as extended, make a written request to the Engineer for an extension of time setting forth the reasons which he believes will justify the granting of his/her request. Requests for extension of time on calendar day projects, caused by inclement weather, shall be supported with National Weather Bureau data showing the actual amount of inclement weather exceeded which could normally be expected during the contract period. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, he may extend the time for completion in such amount as the conditions justify. The extended time for completion shall then be in full force and effect, the same as though it were the original time for completion.

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 subsection titled DETERMINATION AND EXTENSION OF CONTRACT TIME of this Section) 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/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 his/her contract.

SCHEDULE	LIQUIDATED DAMAGES COST	ALLOWED CONSTRUCTION TIME
I	\$1,500 per Calendar Day	20 Calendar Days
II	\$1,500 per Calendar Day	20 Calendar Days
III	\$1,500 per Calendar Day	25 Calendar Days
IV	\$1,500 per Calendar Day	10 Calendar Days

The maximum construction time allowed for Schedules I, II, III and IV will be the sum of the time allowed for individual schedules awarded but not more than 75 calendar days.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a 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 his/her 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 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 prosecution 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 him 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 Engineer consider the Contractor in default of the contract for any reason hereinbefore, he shall immediately give written notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the contract.

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

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

80-10 TERMINATION FOR NATIONAL EMERGENCIES. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the prosecution 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/her responsibilities for the completed work nor shall it relieve his/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 Engineer prior to beginning any work in all areas of the airport. No operating runway, taxiway, or Air Operations Area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate his/her work in such a manner as to insure safety and a minimum of hindrance to flight operations. All Contractor equipment and material stockpiles shall be stored a minimum of **400** feet from the centerline of an active runway. No equipment will be allowed to park within the approach area of an active runway at any time. No equipment shall be within **200** feet of an active runway at any time.

END OF SECTION 80

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SECTION 90 MEASUREMENT AND PAYMENT

90-01 MEASUREMENT OF QUANTITIES. All work completed under the contract will be measured by the Engineer, or his/her authorized representatives, using United States Customary Units of Measurement or the International System of Units.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

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 meter) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the Engineer.

Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

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.

In computing volumes of excavation the average end area method or other acceptable methods will be used.

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 inches.

The term "ton" will mean the short ton consisting of 2,000 pounds (907 kilograms) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, approved scales by competent, qualified personnel at locations designed by the Engineer. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the Engineer directs, and each truck shall bear a plainly legible identification mark.

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 to the Engineer, 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.

When requested by the Contractor and approved by the Engineer 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 Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Bituminous materials will be measured by the gallon (liter) or ton (kilogram). When measured by volume, such volumes will be measured at 60 F (15 C) or will be corrected to the volume at 60 F (15 C) using ASTM D 1250 for asphalts or ASTM D 633 for tars.

Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when bituminous material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work.

When bituminous materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, may be used for computing quantities.

Cement will be measured by the ton (kilogram) or hundredweight (kilogram).

Timber will be measured by the thousand feet board measure (M.F.B.M.) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

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.

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 by the Engineer in connection with force account work will be measured as agreed in the change order or supplemental agreement authorizing such force account work as provided in the subsection titled PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK of this section.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gage, 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 for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales.

Scales shall be accurate within one-half percent of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the inspector before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed one-tenth of 1 percent of the nominal rated capacity of the scale, but not less than 1 pound (454 grams). The use of spring balances will not be permitted.

Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the inspector can safely and conveniently view them.

Scale installations shall have available ten standard 50-pound (2.3 kilogram) weights for testing the weighing equipment or suitable weights and devices for other approved equipment.

Scales must be tested for accuracy and serviced before use at a new site. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end.

Scales ``overweighing" (indicating more than correct weight) will not be permitted to operate, and all materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of one-half of 1 percent.

In the event inspection reveals the scales have been ``underweighing" (indicating less than correct weight), they shall be adjusted, and no additional payment to the Contractor will be allowed for materials previously weighed and recorded.

All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.

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

90-02 SCOPE OF PAYMENT. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials, for performing all work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof, subject to the provisions of the subsection titled NO WAIVER OF LEGAL RIGHTS of Section 70.

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 subsection titled ALTERATION OF WORK AND QUANTITIES of Section 40 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 his/her 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 subsection titled OMITTED ITEMS of Section 40, the Engineer shall have the right to omit from the work (order nonperformance) any contract item, except major contract items, in the best interest of the Owner.

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

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

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

90-05 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK. Extra work, performed in accordance with the subsection titled EXTRA WORK of Section 40, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work. When the change order or supplemental agreement authorizing the extra work requires that it be done by force account, such force account shall be measured and paid for based on expended labor, equipment, and materials plus a negotiated and agreed upon allowance for overhead and profit.

a. Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

b. Comparison of Record. The Contractor and the Engineer shall compare records of the cost of force account work at the end of each day. Agreement shall be indicated by signature of the Contractor and the Engineer or their duly authorized representatives.

c. Statement. No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with duplicate itemized statements of the cost of such force account work detailed as follows:

(1) Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.

(2) Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

(3) Quantities of materials, prices, and extensions.

(4) Transportation of materials.

(5) Cost of property damage, liability and workman's compensation insurance premiums, unemployment insurance contributions, and social security tax.

Statements shall be accompanied and supported by a receipted invoice for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

90-06 PARTIAL PAYMENTS. Partial payments will be made at least once each month as the work progresses. Said payments will be based upon estimates prepared by the Engineer of the value of the work performed and materials complete 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 the subsection titled PAYMENT FOR MATERIALS ON HAND of this section. No partial payment will be made when the amount due the Contractor since the last estimate amounts to less than five hundred dollars.

The Contractor is required to pay all subcontractors for satisfactory performance of their

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. 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.

Retainage will not be withheld on this project. No retainage will be withheld by the Owner from progress payments due the prime Contractor. Retainage by the prime or subcontractors is prohibited, and no retainage will be held by the prime from progress due subcontractors.

When at least 95% of the work has been completed, the Engineer shall, at the Owner's discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done.

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

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in the subsection titled ACCEPTANCE AND FINAL PAYMENT of this section.

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 retained percentage or final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

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

a. The material has been stored or stockpiled in a manner acceptable to the Engineer at or on an approved site.

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

c. The Contractor has furnished the Engineer with satisfactory evidence that the material and transportation costs have been paid.

d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material 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 anytime 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/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 subsection.

90-08 PAYMENT OF WITHHELD FUNDS. At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in subsection 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 10 percent 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 subsection titled FINAL ACCEPTANCE of Section 50, the Engineer will prepare the final estimate of the items of work actually performed. The Contractor shall approve the Engineer's final estimate or advise the Engineer of his/her objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the Engineer shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the Engineer's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the Engineer's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with the subsection titled CLAIMS FOR ADJUSTMENT AND DISPUTES of Section 50.

After the Contractor has approved, or approved under protest, the Engineer's final estimate, 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 subsection titled CLAIMS FOR ADJUSTMENTS AND DISPUTES of Section 50 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.

END OF SECTION 90

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SECTION 100 CONTRACTOR QUALITY CONTROL PROGRAM

100-01 GENERAL. When the specification requires a Contractor Quality Control Program, the Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The intent of this section is to enable the Contractor to establish a necessary level of control that will:

- a. Adequately provide for the production of acceptable quality materials.
- b. Provide sufficient information to assure both the Contractor and the Engineer that the specification requirements can be met.
- c. Allow the Contractor as much latitude as possible to develop his or her own standard of control.

The Contractor shall be prepared to discuss and present, at the preconstruction conference, his/her understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been reviewed by the Engineer. No partial payment will be made for materials subject to specific quality control requirements until the Quality Control Program has been reviewed.

The quality control requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the acceptance testing requirements. Acceptance testing requirements are the responsibility of the Engineer.

100-02 DESCRIPTION OF PROGRAM.

a. **General Description.** The Contractor shall establish a Quality Control Program to perform inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. This Quality Control Program shall ensure conformance to applicable specifications and plans with respect to materials, workmanship, construction, finish, and functional performance. The Quality Control Program 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 quality control.

- c. **Quality Control Program.** The Contractor shall describe the Quality Control Program in a written document that shall be reviewed by the Engineer prior to the start of any production, construction, or off-site fabrication. The written Quality Control Program shall be submitted to the Engineer for review at least 10 calendar days before the start of construction.

The Quality Control Program shall be organized to address, as a minimum, the following items:

- a. Quality control organization;
- b. Project progress schedule;
- c. Submittals schedule;
- d. Inspection requirements;
- e. Quality control testing plan;
- f. Documentation of quality control activities; and
- g. Requirements for corrective action when quality control and/or acceptance criteria are not met.

The Contractor is encouraged to add any additional elements to the Quality Control Program that he/she deems necessary to adequately control all production and/or construction processes required by this contract.

100-03 QUALITY CONTROL ORGANIZATION. The Contractor Quality Control Program shall be implemented by the establishment of a separate quality control organization. An organizational chart shall be developed to show all quality control personnel and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all quality control staff by name and function, and shall indicate the total staff required to implement all elements of the Quality Control Program, including inspection and testing for each item of work. If necessary, different technicians can be utilized 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 Quality Control Program, 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 quality control organization shall consist of the following minimum personnel:

a. Program Administrator. The Program Administrator shall be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The Program Administrator shall have a minimum of 5 years of experience in airport and/or highway construction and shall have had prior quality control experience on a project of comparable size and scope as the contract.

Additional qualifications for the Program Administrator shall include at least 1 of the following requirements:

(1) Professional engineer with 1 year of airport paving experience acceptable to the Engineer.

(2) Engineer-in-training with 2 years of airport paving experience acceptable to the Engineer.

(3) An individual with 3 years of highway and/or airport paving experience acceptable to the Engineer, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

(4) Construction materials technician certified at Level III by the National Institute for Certification in Engineering Technologies (NICET).

(5) Highway materials technician certified at Level III by NICET.

(6) Highway construction technician certified at Level III by NICET.

(7) A NICET certified engineering technician in Civil Engineering Technology with 5 years of highway and/or airport paving experience acceptable to the Engineer.

The Program Administrator shall have full authority to institute any and all actions necessary for the successful implementation of the Quality Control Program to ensure compliance with the contract plans and technical specifications. The Program Administrator shall report directly to a responsible officer of the construction firm. The Program Administrator may supervise the Quality Control Program on more than one project provided that person can be at the job site within 2 hours after being notified of a problem.

b. Quality Control Technicians. A sufficient number of quality control technicians necessary to adequately implement the Quality Control Program shall be provided. These personnel shall be either engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II or higher construction materials technician or highway construction technician and shall have a minimum of 2 years of experience in their area of expertise.

The quality control technicians shall report directly to the Program Administrator 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 Section 100-06.

(2) Performance of all quality control tests as required by the technical specifications and Section 100-07.

Certification at an equivalent level, by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing Levels. The Contractor shall provide sufficient qualified quality control 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 Quality Control Program shall state where different technicians will be required for different work elements.

100-04 PROJECT PROGRESS SCHEDULE. The Contractor shall submit a coordinated construction schedule for all work activities. The schedule shall be prepared as a network diagram in Critical Path Method (CPM), PERT, or other format, or as otherwise specified in the

contract. As a minimum, it shall provide information on the sequence of work activities, milestone dates, and activity duration.

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.

100-05 SUBMITTALS SCHEDULE. The Contractor shall submit a detailed listing of all submittals (e.g., mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include:

- a. Specification item number;
- b. Item description;
- c. Description of submittal;
- d. Specification paragraph requiring submittal; and
- e. Scheduled date of submittal.

100-06 INSPECTION REQUIREMENTS. Quality control 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 Section 100-07.

Inspections shall be performed daily 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, quality control test results and periodic inspections shall be utilized 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 utilized in proportioning and mixing shall be inspected to ensure its proper operating condition. The Quality Control Program shall detail how these and other quality control functions will be accomplished and used.

b. During field operations, quality control test results and periodic inspections shall be utilized to ensure the quality of all materials and workmanship. All equipment utilized 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 Program shall document how these and other quality control functions will be accomplished and used.

100-07 QUALITY CONTROL TESTING PLAN. As a part of the overall Quality Control Program, the Contractor shall implement a quality control 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 quality control tests that the Contractor deems necessary to adequately control production and/or construction processes.

The testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

- a. Specification item number (for example, P-401)
- b. Item description (for example, Plant Mix Bituminous Pavements)
- c. Test type (for example, gradation, grade, asphalt content)
- d. Test standard (for example, ASTM or AASHTO test number, as applicable)
- e. Test frequency (for example, as required by technical specifications or minimum frequency when requirements are not stated)
- f. Responsibility (for example, plant technician)
- g. Control requirements (for example, target, permissible deviations)

The testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D 3665. The Engineer shall be provided the opportunity to witness quality control sampling and testing.

All quality control test results shall be documented by the Contractor as required by Section 100-08.

100-08 DOCUMENTATION. The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required 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 Engineer daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the Contractor's Program Administrator.

Specific Contractor quality control records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily Inspection Reports. Each Contractor quality control technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations on a form acceptable to the Engineer. These technician's daily reports shall provide factual evidence that continuous quality control inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description;
- (2) Compliance with approved submittals;
- (3) Proper storage of materials and equipment;
- (4) Proper operation of all equipment;
- (5) Adherence to plans and technical specifications;
- (6) Review of quality control tests; and
- (7) Safety inspection.

The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible quality control technician and the Program Administrator. The Engineer shall be provided at least one copy of each daily inspection report on the work day following the day of record.

b. Daily Test Reports. The Contractor shall be responsible for establishing a system that will record all quality control 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; and
- (9) Retests.

Test results from each day's work period shall be submitted to the Engineer prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical quality control charts. The daily test reports shall be signed by the responsible quality control technician and the Program Administrator.

100-09 CORRECTIVE ACTION REQUIREMENTS. The Quality Control Program 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 Quality Control Program as a whole, and for individual items of work contained in the technical specifications.

The Quality Control Program shall detail how the results of quality control 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 utilize statistical quality control charts for individual quality control tests. The requirements for corrective action shall be linked to the control charts.

100-10 SURVEILLANCE BY THE ENGINEER. All items of material and equipment shall be subject to surveillance by the Engineer at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate quality control system in conformance with the requirements detailed herein and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to surveillance by the Engineer at the site for the same purpose.

Surveillance by the Engineer does not relieve the Contractor of performing quality control inspections of either on-site or off-site Contractor's or subcontractor's work.

100-11 NONCOMPLIANCE.

a. The Engineer will notify the Contractor of any noncompliance with any of the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Any notice, when delivered by the Engineer or his/her authorized representative to the Contractor or his/her authorized representative at the site of the work, shall be considered sufficient notice.

b. In cases where quality control activities do not comply with either the Contractor Quality Control Program or the contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, as determined by the Engineer, the Engineer may:

(1) Order the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

END OF SECTION 100

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SECTION 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(s), 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 = Individual subplot values
 n = Number of sublots

- 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 values in the set

d_1, d_2, \dots = Deviations of the individual subplot values x_1, x_2, \dots from the average value X

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

n = Number of sublots

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

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

Where: L = specification lower tolerance limit

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

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

$$Q_L = (X - L) / S_n \quad \text{and} \quad Q_U = (U - X) / S_n$$

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.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$
$$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$$
$$X = 97.95 \text{ percent density}$$

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.

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

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

$$X = 3.57 \text{ percent}$$

3. Calculate the standard deviation S_n for the lot.

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

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

$$S_n = 1.12$$

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

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

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

$$Q_L = 1.3992$$

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

$$P_L = 97$$

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

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

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

$$Q_U = 1.2702$$

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

$$P_U = 93$$

8. Calculate Air Voids PWL

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

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

EXAMPLE OF OUTLIER CALCULATION (Reference ASTM E 178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

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

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

2. Use $n=4$ and upper 5 percent significance level of to find the critical value for test criterion = 1.463.

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

- a. For measurements greater than the average:
If $(\text{measurement} - \text{average})/(\text{standard deviation})$ is less than test criterion,
Then: the measurement is not considered an outlier

for A-3 check if $(99.30 - 97.95) / 1.15$ greater than 1.463
Since 1.174 is less than 1.463, the value is not an outlier.

- b. For measurements less than the average:
If $(\text{average} - \text{measurement})/(\text{standard deviation})$ is less than test criterion,
the measurement is not considered an outlier.

for A-1 check if $(97.95 - 96.60) / 1.15$ greater than 1.463.
Since 1.435 is less than 1.463, the value is not an outlier.

NOTE: In this example, a measurement would be considered an outlier if the density were:
greater than $(97.95 + 1.463 \times 1.15) = 99.63$ percent or,
less than $(97.95 - 1.463 \times 1.15) = 96.27$ percent

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

TABLE 1. TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)

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

END OF SECTION 110

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SECTION 120 NUCLEAR GAUGES

120-01 TESTING.

When the specifications provide for nuclear gage acceptance testing of material for Items P-152, and P-154 the testing shall be performed in accordance with this section. At each sampling location, the field density shall be determined in accordance with ASTM D 6938 using the Direct Transmission Method. The nuclear gage shall be calibrated in accordance with ASTM D 6938. Calibration and operation of the gage shall be in accordance with the requirements of the manufacturer. The operator of the nuclear gage must show evidence of training and experience in the use of the instrument. The gage shall be standardized daily in accordance with ASTM standards.

When using the nuclear method, ASTM D 6938 shall be used to determine the moisture content of the material. The calibration curve furnished with the nuclear gauges shall be checked in accordance with ASTM standards. The calibration checks shall be made at the beginning of a job and at regular daily intervals.

The material shall be accepted on a lot basis. Each Lot shall be divided into eight (8) sublots when ASTM D 6938 is used.

120-02 VERIFICATION TESTING. (For Items P-152 and P-154 only.)

The Engineer will verify, by analyzing data provided by the QA tester, the maximum laboratory density of material placed in the field for each lot. A minimum of one test will be made for each lot of material at the site. The verification process will consist of; (1) compacting the material and determining the dry density and moisture-density in accordance with ASTM D 1557 for aircraft gross weights 60,000 pounds or more, and (2) comparing the result with the laboratory moisture-density curves for the material being placed. This verification process is commonly referred to as a "one-point Proctor". If the material does not conform to the existing moisture-density curves, the laboratory will establish the laboratory maximum density and optimum moisture content for the material in accordance with ASTM D 1557 for aircraft gross weights 60,000 pounds or more.

Additional verification tests will be made, if necessary, to properly classify all materials placed in the lot.

The percent compaction of each sampling location will be determined by dividing the field density of each subplot by the laboratory maximum density for the lot.

END OF SECTION 120

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SPECIAL PROVISIONS

SPECIAL PROVISIONS5 Pages

1. General
2. Plans
3. Location
4. Insurance
5. Contract Period
6. Work Schedule and Project Phasing
7. Preconstruction Conference
8. Underground Utilities
9. Permits, Taxes & Compliance with Laws
10. Field Office
11. Haul Roads
12. Testing & Staking
13. Airport Security
14. Closure of Air Operations Areas
15. Accident Prevention
16. Existing Underground Cables
17. Utilities
18. Standard of Care/Warranty
19. Attorney's Fees
20. Construction Safety and Phasing Plan with Construction Safety Drawings
21. Safety Plan Compliance Document
 - FAA Advisory Circular 150/5210-5D
 - FAA Advisory Circular 150/5210-20
22. Construction Management Plan
23. Stormwater Discharge Permit

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SPECIAL PROVISIONS

1. GENERAL.

Work to be done under this Agreement consists of furnishing all labor, materials, equipment and accessories and performing all operations necessary to complete the Work in accordance with the Drawings and Specifications.

The following "Special Provisions" shall govern in case of any discrepancies in any or all of the following Specifications, and the intent, either expressed or implied in these "Special Provisions", shall govern in the interpretation of the Plans and Specifications.

The Bidder is required to examine carefully the site of the Proposed Work, the Proposal, Plans and Specifications. He shall satisfy himself as to the character, quality and quantities of Work to be performed, materials to be furnished, and as to the requirements of these Specifications. The submission of a Proposal shall be evidence that the Bidder has made such an examination.

2. PLANS.

The Plans governing and controlling the Work and to which reference is made throughout the Technical Specifications and other Contract Documents are those plans prepared by Armstrong Consultants, Inc. entitled Four Corners Regional Airport, Farmington, NM, AIP Project No.3-35-0016-039-2016.

3. LOCATION.

Four Corners Regional Airport is located at 1300 W. Navajo St. in the City of Farmington, New Mexico.

4. INSURANCE.

The Contractor shall pay for and maintain during the life of this Contract adequate Worker'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 in the amount of not less than \$2,000,000.00 for injuries, including accidental death, to any one person, nor less than \$2,000,000.00 on account of any one accident. Property Damage Insurance shall be carried in an amount not less than \$2,000,000.00. Such Liability Insurance shall include completed operation coverage. The Sponsor and the Engineer shall both be named as additional insured on these policies.

5. CONTRACT PERIOD.

The Contractor understands and agrees that it must commence the Work required hereunder on the date stated on the Notice to Proceed as issued by the Sponsor, and that the Contractor must complete the entirety of the Work under all schedules within the Contract Time specified in the Agreement.

6. WORK SCHEDULE AND PROJECT PHASING.

After the Award of Contract and prior to receiving the Notice to Proceed, the Contractor shall submit to the Engineer a Safety Plan Compliance Document (located in Special Provisions 21). The Sponsor reserves the right to request changes in the sequence of

Project schedules if such change is required in the interest of safety or airport operation. The Project schedule shall clearly identify runway closure time(s) which shall be kept to the absolute minimum necessary.

Construction shall be phased in a manner to minimize disruption to air traffic operations. Access shall be maintained from the aircraft parking area and runway at all times.

7. PRE-CONSTRUCTION CONFERENCE.

After the Notice to Proceed has been issued and prior to commencement of any Work, the Airport Manager as the Sponsor's Representative will meet with the Engineer and the Contractor to discuss the Work in general, including administrative matters, the Contractor's Quality Control Program, accident prevention, and safety; to answer any questions of the Engineer or Contractor; and to resolve any potential problems before the Work commences.

8. UNDERGROUND UTILITIES.

All known existing utilities have been depicted on the Plans as accurately as possible. In many cases exact location, depth, and pipe size and type are not known. The Contractor is responsible for contacting appropriate utility locator services prior to construction.

In the State of New Mexico call: New Mexico One-Call, Inc. (800) 321-2537, www.nmonecall.org please notify 2 working days in advance. Where the Plans call for the Contractor to relocate an existing utility and the affected utility material composition differs from that shown on the Plans, the Contractor shall immediately notify the Engineer.

9. PERMITS, TAXES & COMPLIANCE WITH LAWS.

The Contractor shall procure and pay for all permits, taxes, 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. Costs of compliance and/or all taxes shall be included in the Unit Prices Bid for each Contract Item.

10. FIELD OFFICE.

The Contractor will be required to provide a field office and furnishings as noted in Section 60, Paragraph 5 of the General Provisions.

11. 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 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.

12. TESTING & STAKING.

The Contractor is responsible for conducting and payment for all quality control testing, survey and staking noted in these Specifications. Acceptance testing will be furnished by an independent testing laboratory that is retained and paid by the Owner. The person responsible for conducting the testing/staking shall be approved by the Engineer. Field test results shall be furnished daily by the Contractor and the independent testing laboratory in written form to the Engineer's Representative on the Project site and shall be submitted weekly by the Contractor and the independent testing laboratory to the Engineer typed on the forms supplied with the Construction Management Plan. Failure to submit written test results daily or typed test results weekly shall be grounds for suspension of Work (but not Contract Time) until the test results are submitted to the Engineer. Any requested testing data and/or surveying notes shall be supplied to the Engineer by the Contractor and the independent testing laboratory at no cost.

13. AIRPORT SECURITY.

During the course of the construction operations, the Contractor will be allowed to utilize an agreed upon number of airport accesses as entrances to the construction site. These gates and the associated haul roads shall be designated by the Engineer. The Contractor shall be required to keep these gates and all other temporary gaps in fencing closed during non-construction hours and guarded as necessary during construction hours to protect the runway from stray livestock. Occupants of any vehicles allowed on the airport shall be the responsibility of the Contractor and the Contractor shall control which vehicles are allowed to enter the airport property during construction except for normal airport operations uses.

14. 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.

15. 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.

16. EXISTING UNDERGROUND CABLES.

The Contractor shall attempt to locate the Sponsor's and/or FAA's underground cables prior to construction. Damage to the underground cables by 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.

17. UTILITIES.

Any utilities required by the Contractor for the prosecution of the Work shall be paid for by

the Contractor.

18. STANDARD OF CARE/WARRANTY.

The Contractor shall perform all of the work required under the Contract Documents, in accordance with the expertise and skill that would be expected of a Contractor, expert in airport construction projects in general, and the Work required under the Contract Documents, in particular. In addition, the Contractor warrants that materials and equipment furnished under the Contract Documents will be of good quality and new, unless otherwise required by the Contract Documents, that the Work will be free from defects not inherent in the Work involved, and that the Work will conform, in all respects, to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. The Contractor's warranty excludes defects due to abuse not caused by the Contractor, Subcontractors, or other third parties operating under the direction or control of the Contractor, modifications not executed or approved by the Contractor, improper or insufficient maintenance, by the Sponsor, improper operation by the Sponsor, or normal wear and tear under normal usage.

19. ATTORNEY'S FEES.

Should either party breach its obligations under the Agreement to be executed between the Contractor and Sponsor, or under any of the other Contract Documents, the breaching party shall be responsible for reimbursing the non-breaching party for all reasonable Attorney's fees and court costs incurred by the non-breaching party in enforcing its rights under the Contractor's agreement or the other Contract Documents.

20. CONSTRUCTION SAFETY AND PHASING PLAN WITH CONSTRUCTION SAFETY DRAWINGS.

To follow on next page.

FOUR CORNERS REGIONAL AIRPORT

Farmington, New Mexico

CONSTRUCTION SAFETY & PHASING PLAN

SCHEDULE I

RECONSTRUCT CONNECTOR TAXIWAY G

SCHEDULE II

RECONSTRUCT TAXIWAY F

SCHEDULE III

RECONSTRUCT TAXIWAY G

SCHEDULE IV

RECONSTRUCT TAXIWAY E

AIP No. 3-35-0016-039-2016

ACI No. 166351

March 2016



ARMSTRONG

2305 Renard Place SE, Suite 210
Albuquerque, NM 87106
Office (505) 508-2192
Fax (505) 508-2795
www.armstrongconsultants.com

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SPONSOR CONCURRENCE

The City of Farmington, New Mexico has read and agreed to this Safety and Phasing Plan document.

Designed By Date

SPONSOR APPROVAL:

City Representative Date

FAA APPROVAL:

Date

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FOUR CORNERS REGIONAL AIRPORT

AIP No. 3-35-0016-039-2016

The Contractor's Safety Plan Compliance Document (SPCD) shall be in accordance with the FAA AC 150/5370-2F which is enclosed in the Contract Documents. The Engineer for this project is Armstrong Consultants, Inc. The Project Manager is Eric Rivera, (505) 508-2192.

1. COORDINATION.

- a. Contractor is to conduct weekly progress meetings to update Sponsor on construction progress and/or delays in construction.
- b. Weekly meeting shall update construction schedule and identify any scope changes necessary. The Contractor shall identify the areas where the work will be done during the current week.
- c. Any changes to the Construction Safety and Phasing Plan (CSPP) shall be coordinated with the FAA Airports Regional or District Office and Sponsor. Coordination with appropriate local and other Federal Government Agencies (i.e.: EPS, OSHA, TSA and State EPA) may be required.

2. PHASING.

- a. The project scope consists of the following:

The project will consist of reconstructing approximately 25,000 square yards of Taxiways E, F and G. This will require removing the existing pavement to the required depth and replacing it with new base courses and asphalt pavement. The taxiways will be reconstructed to their current geometry with the exception of Taxiway F. Taxiway F will be widened and reconfigured to meet AC 150/5300-13A. Existing signage and lights will be left in place with the exception of 2 signs that will be relocated due to the changed pavement geometry of Taxiway F. Reflectors will be installed along Taxiway F. The height of the existing lights on Taxiway E, F, and G will be adjusted as needed to meet frangibility requirements. The project will be divided into four schedules.

SCHEDULE I: RECONSTRUCT CONNECTOR TAXIWAY G

SCHEDULE II: RECONSTRUCT TAXIWAY F

SCHEDULE III: RECONSTRUCT TAXIWAY G

SCHEDULE IV: RECONSTRUCT TAXIWAY E

The proposed duration for Schedule I is 20 calendar days, Schedule II is 20 calendar days, Schedule III is 25 calendar days, and Schedule IV is 10 calendar days. The total project time should not exceed 75 calendar days.

The intent of the construction is to reconstruct the taxiways with minimal closure of Runway 7/25 and Runway 5/23. At any given time through the duration of the project, at least one runway shall be open and operational. The project will be broken into three phases of construction which can be seen in The Construction Safety and Phasing Plan Drawings located in APPENDIX A of this document. Taxiways E, F, and G in the project area shall remain closed for the entire duration of the project. All operations and movement within the airfield shall be in coordination with the Air Traffic Control Tower (ATCT).

Phasing, as referred to in this document, is independent of the project bid schedules. The term "Phase" in this CSPP document is used to describe the required state of closures, openings, work area limits, and barricade locations when construction is being performed within a particular area on the airfield.

Phase I of construction will not require closure of Runway 5/23 nor Runway 7/25. Construction activities will be performed outside of the Runway Safety Area (RSA) and Runway Obstacle Free Zone (ROFZ) of both runways. The airfield barricades shall be in the Phase I configuration at all times during the project if not in Phase II or III.

Phase II of construction will require the closure of Runway 5/23 because it will require construction activities in the ROFZ and RSA of the Runway 5/23. For Runway 5/23, a maximum closure time of 20 days will be allowed (10 days for Schedule I and 10 additional days for Schedule IV). Runway closures for Runway 5/23 may be done intermittently as needed for construction sequencing. However, any time the runway is to be closed, all barricades and closure X's shall be properly installed as shown on the attached CSPP plan sheets (see Appendix A). Also, the airport manager shall be notified at least two weeks in advance of any scheduled runway closures or openings. Runway 7/25 shall remain open and operational during Phase II. Before any runway is to be reopened, all equipment and materials shall be cleared from the ROFZ, runway safety areas must be reset to their pre-closure state, and all debris from construction activities shall be swept from the runway surface or removed by necessary means.

Phase III of construction will require the closure of Runway 7/25 because it will require construction activities in the ROFZ and RSA of Runway 7/25. For Runway 7/25, a maximum closure time of 20 days will be allowed (10 days for Schedule II and 10 additional days for Schedule IV). Closures for Runway 7/25 may be done intermittently as needed for construction sequencing. However, any time the runway is to be closed, all barricades and closure X's shall be properly installed as shown on the attached CSPP plan sheets (see Appendix A). Also, the airport manager shall be notified at least two weeks in

advance of any scheduled runway closures or openings. Runway 5/23 shall remain open and operational during Phase III. Before any runway is to be reopened, all equipment and materials shall be cleared from the ROFZ, runway safety areas must be reset to their pre-closure state, and all debris from construction activities shall be swept from the runway surface or removed by necessary means.

- b. The Construction Safety Drawings show the closure of Runway 5/23 and 7/25 and the proper location of low profile barricades for each phase of construction. The FAA Program Manager will be notified of the closure phasing. The Construction Safety Drawings have been reviewed and accepted by the Sponsor.

3. AREAS AND OPERATIONS AFFECTED BY THE CONSTRUCTION ACTIVITY.

Project	Reconstruct Taxiway E, F and G	
Phase	Construction Phase: AIP Number 3-35-0016-039-2016	
Scope of Work	Remove existing pavement to required depth and replace with new base course and asphalt on Taxiway E, F and G. Widen Taxiway F to meet design AC standard.	
Operational Requirements	Normal (Existing)	Phase I (Anticipated)
Runway 7/25 Average Aircraft Operations	Carrier: 4/day GA: 125/day Military: 5/day	Carrier: 4/day GA: 125/day Military: 5/day
Runway 7/25 RDC	B-II	B-II
Runway 7 Approach Visibility Minimums	1-mile	1-mile
Runway 25 Approach Visibility Minimums	3/4-mile	3/4-mile
Runway 7 Approach Procedures	GPS, VOR/DME	GPS, VOR/DME
Runway 25 Approach Procedures	ILS/LOC, GPS	ILS/LOC, GPS
Runway 5/23 RDC	B-II	B-II
Runway 5 Approach Visibility Minimums	1-mile	1-mile
Runway 23 Approach Visibility Minimums	1-mile	1-mile
Runway 5 Approach Procedures	GPS, VOR/DME	GPS, VOR/DME
Runway 23 Approach Procedures	GPS/VOR	GPS/VOR
ARFF Index	Index A	Index A
ATCT (Hours Open)	0600-2200 (L)	0600-2200 (L)

RUNWAY	AIRCRAFT APPROACH CATEGORY A, B, C OR D	AIRPLANE DESIGN GROUP I, II, III OR IV	RSA WIDTH IN FEET DIVIDED BY 2
7	B	II	75
25	B	II	75
5	B	II	75
23	B	II	75

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	
7	II	B	300	200	200
25	II	B	300	200	200
5	II	B	300	200	200
23	II	B	300	200	200

- a. Runway 5/23 has a Runway Design Code (RDC) of B-II and will close during Phase II of construction while work is performed in the RSA on Taxiway E and/or Taxiway G. During the closure of Runway 5/23 the aircraft, in coordination with the Air Traffic Control Tower (ATCT), will be required to use Runway 7/25. Phase II runway closure shall be no longer than 20 days intermittent.
- b. Runway 7/25 has a Runway Design Code (RDC) of B-II and will close during Phase III construction while work is performed in the RSA on Taxiway E and/or Taxiway F. During the closure of Runway 7/25 the aircraft, in coordination with ATCT, will be required to use Runway 5/23. Phase III runway closure shall be no longer than 20 days intermittent.
- c. Taxiways E, F, and G in the work area will be closed for the entire duration of the project. During the closure of Runway 5/23 and 7/25, the aircraft, in coordination with the ATCT, will be required to use the appropriate taxiways to avoid the construction areas. See the CSPP plan sheets for locations of low profile barricades.

4. NAVIGATION AIDS (NAVAIDS) PROTECTION.

- a. This project will not affect the RNAV GPS approaches to Runway 5/23 and 7/25. No NAVAIDS will be affected by this project.

5. CONTRACTOR ACCESS

- a. **Location of Stock Piled Construction Materials.** Stock piles for the project will be located in the northeast region of the airport off of the perimeter road. The stock pile will be included in the contractor's staging area. See Construction Safety Plan for location. See Section 16 for discussion on hazard marking and lighting devices requirements. See Section 6 Wildlife Management for discussion on wildlife issues. See Section 7 Foreign Object Debris (FOD) Management for discussion on FOD control.
- b. **Vehicle and Pedestrian Operations.** The Contractor will be required to gain access to the airfield for this project. The project will require a haul route to cross the east end of Runway 7/25 and Runway 5/23, which will require the contractor to be escorted. These areas are located inside the movement area and communication with the ATCT will be required. The Contractor vehicles will be required to follow FAA Advisory Circular (AC) 150/5210-5. Section 3(f) of the AC states that the Contractor's vehicles can be painted any color or combination of colors other than solid black or white. Also, Section 4(d)(1) requires vehicles other than those that routinely traverse any portion of the Air Operations Area (AOA) under the control of Air Traffic Control (ATC), which are not escorted by a vehicle, be in constant two-way radio communication with ATC and properly equipped and authorized to operate in the AOA, must provide a flag on a staff attached to the vehicle so that the flag will be readily visible. Section 4(d)(2) At airports without air traffic control facilities, flags must be provided on all vehicles. Section 4(d)(3) The flag must be at least a 3-foot by 3-foot square having a checkered pattern of international orange and white squares at least 1 foot on each side. The contractor can also use Vehicle Lighting per Section 5(a)(1) The standard for identification lighting is a yellow flashing light that is mounted on the uppermost part of the vehicle structure. A steady yellow light designates vehicles limited to non-movement areas; (2) the light must be visible from any direction, day and night, including from the air. Appendix B of the AC B-1 addresses the Color Specifications for Vehicle Identification Lights. The Society of Automotive Engineers (SAE) Standard J578 Revised December 2006, Color Specifications, defines the acceptable color boundary limits and measurement of emitted red, white, signal blue, and yellow light for vehicle lights. This standard applies to the overall emitted color of light from the device in lieu of emitted light from any small area of the lens. The color of emitted light must fall within the color boundaries per SAE J578 Revised December 2006 (color boundary equations are in the standard) using color measurement methods detailed in the standard. See FAA Engineering Brief #67, Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures, for additional information and Alternative Lighting Devices. Vehicle operation requirements are found in AC 150/5210-20. Section 5 of the AC states that any person driving on an airport must have an appropriate level of knowledge of airport rules and regulations. Airport operators should require vehicle

operators to maintain a current driver's license and have a means to identification that would permit the operation of a vehicle on the airside of an airport. Any person expected to operate on the movement area should demonstrate a functional knowledge of the English language. The Contractor shall remind the construction operators that as stated in Section 7- Aircraft ALWAYS have the right-of-way over vehicles when maneuvering on non-movement areas. Aircraft also have the right-of-way on the movement areas, except when the Airport Traffic Control Tower has specifically instructed an aircraft to hold or give way to vehicles on a runway or taxiway. Vehicles that are equipped with marking and lighting devices should escort vehicles that are not marked and lighted.

- c. **Two Way Radio Communication.** The Contractor's construction superintendent shall be required to monitor transceiver radios tuned to the Ground Control frequency at 121.7 MHZ at all times when on the airfield. If the Contractor is not familiar with communication with an ATC, he shall request assistance from the Sponsor for a class on proper FAA (ATC) communications. Radios shall be supplied by the Contractor and incidental to the cost of the project. Such radios shall be used to obtain proper clearance in regard to the movement of equipment, trucks, etc. on the airport. The ATC will be included in the preconstruction meeting to educate the Contractor on where communication with the ATC is required. 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. If the Contractor's radio fails, a cell phone number with 24-hour availability will be provided to the ATC at the preconstruction meeting.
- d. **Airport Security.** Farmington Four Corners Regional Airport is a Certificated Part 139 airport. The Contractor may be required to attend the Air Operations Area badging class conducted by the Sponsor. Access to the airfield will be strictly limited and controlled and shall be strictly on an as-needed basis. The Four Corners Regional Airport has a perimeter fence around the entire airport. The Contractor will use the gate as shown on the plan, to access the airport. When the access gate is required to remain open for construction, the Contractor shall provide, at his own expense, an approved gate guard to prevent unauthorized access to the airfield. The Contractor shall coordinate with the Airport Manager to provide an approved list of authorized personnel that are permitted to enter the access gate.

6. WILDLIFE MANAGEMENT.

There currently exists a perimeter fence encompassing the entire airport. This 8' wildlife game fence has several gates around the perimeter of the airport. The fence provides a physical barrier that keeps out the game and wildlife that could walk onto the airfield. It is important that the Contractor control the gate open and closures to keep this wildlife out of the airport. The gate should be closed when

there is no construction traffic to ensure that wildlife cannot gain walking access to the airfield. Section 5(d) requirements shall be taken into consideration to maintain proper airport security. To minimize the bird or flying wildlife, the Contractor shall keep a clean work area and bag all trash and keep it in a sealed container. Should the Contractor encounter any wildlife on the airfield, he should notify the Sponsor immediately so that appropriate actions to mitigate the problem can be implemented. A wildlife hazard assessment study was conducted at the airport and should the Contractor have any issues or questions regarding wildlife on the airport, he should contact the Airport Manager for further guidance.

7. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT.

All excavated material, debris, etc. shall be cleaned from the site at least on a daily basis and more often if required by the Airport Manager or Engineer. To control dust and/or blowing debris, any soil, debris or loose material shall immediately be swept up and removed. The Contractor shall follow Section 10 to ensure that the construction site is clean and FOD is not an issue for safe usage of the airport.

8. HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT.

At the preconstruction meeting, the Contractor shall discuss the fueling operation for all equipment on site. Any spills that occur on site shall be brought to the attention of the Sponsor immediately. The Contractor shall also notify the Sponsor of any and all required remedial work required and follow appropriate methods for cleaning up the contaminate site. The Contractor shall also make sure the Sponsor is in attendance to witness the clean up and provide written documentation to the Sponsor stating the remedial work is complete per EPA regulations, and the Sponsor's SWPPP. The Contractor should provide the Sponsor of all materials being delivered to the construction area and maintain MSDS sheets for such materials on the airport site. HAZMAT vehicles that respond to this airport would typically be the local firefighting units. The Four Corners Regional Airport currently has ARFF response vehicles. The Contractor will also be required to verify that NPDES permit requirements are met as stated in AC 150/5320-15(12.13.2):

"Unauthorized dry weather discharges, such as discharges resulting from runway maintenance, aircraft deicing/anti-icing operations, or vehicle and aircraft washes, require a separate NPDES permit based either on application Form 2C, *Wastewater Discharge Information*, for process water, or Form 2E, *Facilities Which Do Not Discharge Process Wastewater*, for non-process water."

9. NOTIFICATION OF CONSTRUCTION ACTIVITIES.

The Contractor shall list the names of individuals that will be responsible for specific items on the construction site. The names that are listed shall be given to the Sponsor as well as posted on a bulletin board on the project. There is 911 emergency service at the Airport which shall be posted on the bulletin board. The following are contacts and names that need to be identified:

Office/Testing Address and Phone Numbers:

Contractor Name

Contractor Address

City, State, Zip Code

Ph.: xxx-xxx-xxxx

Fax: xxx-xxx-xxxx

- Project Superintendent: _____ Cell Phone: _____
- Superintendent: _____ Cell Phone: _____
- 24-Hour Contact: _____ Cell Phone: _____
- Gate Guard: _____ Cell Phone: _____
- Lab/Field Supervisor: _____ Cell Phone: _____
- Paving Supervisor: _____ Cell Phone: _____
- Safety Officer: _____ Cell Phone: _____
- Quality Control Officer: _____ Cell Phone: _____
- Job Site Environmental Officer: _____ Cell Phone: _____
- City/Town Official(Name): Mike Lewis Cell Phone: 505-320-0211

Subcontractor information shall be available to the Sponsor, FAA Program Manager, ATCT and Engineer as well.

The Airport Manager (Mike Lewis) shall issue or cancel all required NOTAM's. There is 911 response to the Airport for police, fire fighting and medical emergencies. The Contractor shall identify the following and post on the project bulletin board:

- *San Juan Regional Medical Center, 801 West Maple Street, Farmington NM, (505)609-2000*
- *Poison Control 800-222-1222*

10. INSPECTION REQUIREMENTS.

The Contractor will identify per Section 9, a Safety Officer that will be required to inspect on a daily basis, all barricades and flashers prior to work commencing and prior to leaving the work site. The Contractor will notify the Resident Inspector that all inspections have been completed. The Contractor shall determine if there is a need to increase the inspections based on the project and site conditions. There will be no decrease in the amount of required inspections. At the project final inspection, the project site shall be clean and free of all debris related to the project construction.

11. UNDERGROUND UTILITIES.

The Contractor shall be responsible for contacting appropriate utility locator services prior to construction. The Contractor shall attempt to locate the Sponsor's and/or FAA's underground cables prior to construction. Damage to underground cables by the Contractor will require replacement by the Contractor at no cost to the Sponsor and/or FAA. Any splicing or replacing of damaged cable shall meet

current FAA specifications. Should damage be caused to any underground utility, the Contractor shall follow Section 9 for contacting appropriate personnel. Should there be any issues with FAA owned and maintained equipment for the airport due to construction activity; the FAA Facilities shall be notified immediately at 817-222-4523.

12. PENALTIES.

If at any point a safety violation is noted, all construction activities in the area of the violation will be immediately terminated. Before construction can begin, the Contractor will provide a written statement demonstrating to the Owner that the construction can once again occur without violations to the Safety procedures. The Contractor is not eligible for additional compensation for the down time or any other claim when construction is terminated due to safety violations.

The Airport Manager can suspend construction activities at any time during which they note safety violations. The duty of the Engineer or Owner to conduct construction review of the Contractor's performance is not intended to include review of adequacy of the Contractor's safety measures, in, or near the construction site. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions on the job site including safety of all persons and property during performance of the work. This requirement shall apply continuously and will not be limited to working hours.

13. SPECIAL CONDITIONS.

The Contractor shall monitor any weather conditions, aircraft emergencies, unexpected emergencies and other elements that may cause safety on the project to be jeopardized. If there is an emergency, the contractor shall notify City of Farmington Emergency Response as referenced in Section 9. Section 5 shall be followed for any radio issues that may arise. Section 14 shall be followed for any runway or taxiway visual aids that are changed should emergency vehicle need assistance with airport locations.

14. RUNWAY AND TAXIWAY VISUAL AIDS.

This project does not require any temporary runway and taxiway markings, lights or signs other than the X's at each end of Runway 5/23 and 7/25 during closure periods. The Contractor shall coordinate and use the airport's lighted closure X's. The Contractor shall provide all fuel, oil, lamps, and any other maintenance required during the project. Any damage resulting from the Contractors negligence shall be immediately repaired by the Contractor at no cost to the airport. The lighted X's shall be transported on approved airport surfaces only. When not in use, the X's shall be stored at the location designated by the airport. The Contractor shall be responsible for moving the portable trailer mounted equipment. All costs for use, transportation, operation, and maintenance of the lighted closure X's shall be incidental to the project and shall be the responsibility of the Contractor. Should the airport declare that the lighted closure X's are not available

for use by the Contractor, the Contractor shall be responsible for providing conventional surface closure X's to use during Runway closure.

The Airport Manager, Airport Superintendent and the Contractor's Superintendent shall develop and oversee the lock-out/tag-out plan per 29 CFR Part 1910 Occupational Safety and Health Standards. There will be low profile barricades that will be used to delineate the construction site. As this airport is a Part 139 airport, any temporary or new markings or signs will be required to be approved by the FAA Part 139 inspector prior to placing should it become necessary. The existing NAVAIDS will not be altered, obliterated or shut down for this project. The RNAV GPS approaches to Runway 5/23 and 7/25 will not be affected by this project. Should there be any issues with the NAVAIDS for the airport due to construction activity, the FAA Facilities shall be notified immediately at 817-222-4523.

15. MARKING AND SIGNS FOR ACCESS ROUTES.

Haul routes and other activities on the airport by the Contractor, subcontractors, and Engineer shall be coordinated with and approved in advance by the Airport Manager. Any traffic signs to delineate the haul route shall meet the Manual on Uniform Traffic Control Devices (MUTCD) standards, including but not limited to the frangible and height requirements.

16. HAZARD MARKING AND LIGHTING.

Low profile barricades with the MUTCD standard reflective orange and white marking with the 20"min x 20"min flags mounted on the center of the barricade will be used to delineate the construction site. The barricades shall also be required to have the flashing red caution lights. The barricades shall be spaced no more than 20 feet apart where shown on the safety plan. The barricades shall be weighed against propwash and capable of withstanding up to 100 MPH wind forces. Flashing red caution lights shall be battery operated and shall maintain such intensity so as to be readily identified from distances of at least 200 feet during darkness. The Contractor shall identify the person responsible for the maintenance and the marking and lighting in Section 9.

17. PROTECTION OF RUNWAY AND TAXIWAY SAFETY AREAS.

The Contractor shall be required to keep all men, materials and equipment out of the RSA and OFZ of Runway 5/23 and Runway 7/25 unless they are closed. Taxiways E, F, and G shall remain closed for entire duration of the project. Refer to Section 3 of this document for runway and taxiway closure details. Please refer to Section 5 on proper vehicle and personnel movement within safety areas. Any stockpiling of materials shall refer to Section 5 for information on stockpiling of materials. This project is for Taxiway construction and will require proper edge drops. Should the contractor disturb any of the safety areas or object free areas beyond the scope of the construction area, they shall be repaired at no cost to the Owner. SECTION 16 methods shall be used to delineate such areas in the construction areas. The closure of Runway 5/23, Runway 7/25, and all effected

taxiways will require that Section 9 and Section 14 be referenced for proper methods of NOTAMs issuance visual aids to delineate the construction area. Coordination with the FAA will be discussed to determine the appropriate airspace evaluation requirements.

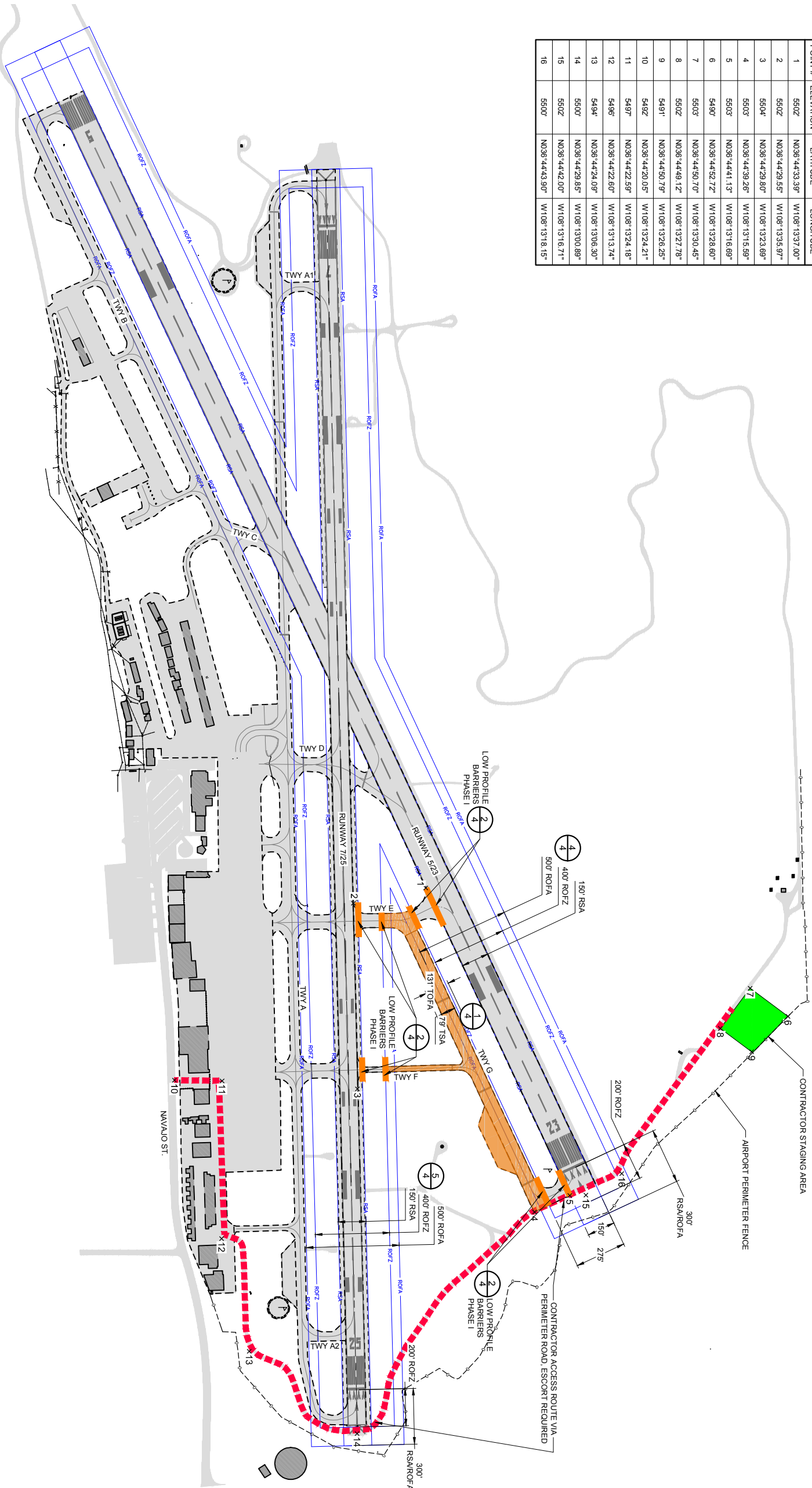
18. OTHER LIMITATIONS ON CONSTRUCTION.

The ATC is in operation from 0600 to 2200 hours. Any construction activity beyond these hours shall be approved by the Airport Manager. Section 2 has no provisions for work outside of these hours; therefore, permission from the FAA, Sponsor, and Engineer will be required to work outside of the ATC hours. Should the Contractor need to utilize a crane or special equipment that is not included in the preliminary equipment list, a 7460-1 will be required. The City of Farmington allows construction operations to occur between 0700 and 1900 hours. Work beyond these hours shall be approved by the City of Farmington.

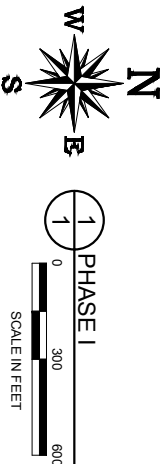
APPENDIX A

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WORK AREAS COORDINATES			
POINT #	ELEVATION	LATITUDE	LONGITUDE
1	5502	N036°44'33.39"	W108°13'37.00"
2	5502	N036°44'29.55"	W108°13'35.97"
3	5504	N036°44'29.80"	W108°13'23.69"
4	5503	N036°44'39.26"	W108°13'15.59"
5	5503	N036°44'41.13"	W108°13'16.69"
6	5490	N036°44'52.72"	W108°13'28.60"
7	5503	N036°44'50.70"	W108°13'30.45"
8	5502	N036°44'49.12"	W108°13'27.78"
9	5491	N036°44'50.79"	W108°13'26.25"
10	5492	N036°44'20.05"	W108°13'24.21"
11	5497	N036°44'22.59"	W108°13'24.18"
12	5496	N036°44'22.60"	W108°13'13.74"
13	5494	N036°44'24.09"	W108°13'06.30"
14	5500	N036°44'29.85"	W108°13'00.89"
15	5502	N036°44'42.00"	W108°13'16.71"
16	5500	N036°44'43.90"	W108°13'18.15"



- PHASE I
- RUNWAY 523 AND RUNWAY 725 WILL REMAIN OPEN DURING CONSTRUCTION.
 - ALL PERSONNEL, VEHICLES, EQUIPMENT, AND MATERIALS SHALL REMAIN CLEAR OF THE RUNWAY SAFETY AREA (RSA) OF RUNWAY 523 AND 725 AT ALL TIMES UNLESS ESCORTED BY AIRPORT PERSONNEL.
 - EQUIPMENT, VEHICLES, AND MATERIALS SHALL NOT BE LEFT UNATTENDED WITHIN THE RUNWAY OBSTACLE FREE ZONES (ROFZ) OF RUNWAY 523 AND 725 AT ANY TIME.
 - LOW PROFILE BARRICADES SHALL BE PLACED ON THE RSA AND ROFZ LINES AS SHOWN.



- LEGEND
- PHASE I WORK AREA (RUNWAY 523 AND RUNWAY 725 OPEN)
 - CONTRACTOR STAGING AREA
 - LOW PROFILE BARRIER
 - CONTRACTOR HAUL ROUTE

- DETAIL #
- ROFZ = RUNWAY OBSTACLE FREE AREA
 - ROFZ = RUNWAY OBSTACLE FREE ZONE
 - RSA = RUNWAY SAFETY AREA
 - TOFA = TAXIWAY OBJECT FREE AREA
 - TSA = TAXIWAY SAFETY AREA
- LATITUDE AND LONGITUDES (LATIONS) DELINEATION OF THE CONSTRUCTION AREA AND CONTRACTOR STAGING AREA LIMITS

FOUR CORNERS REGIONAL AIRPORT
FARMINGTON, NEW MEXICO

A.I.P. NO. 3-35-0016-039-2016
2016 IMPROVEMENTS



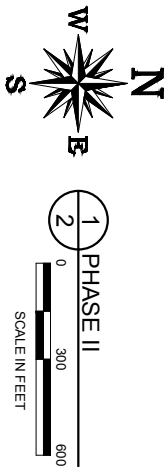
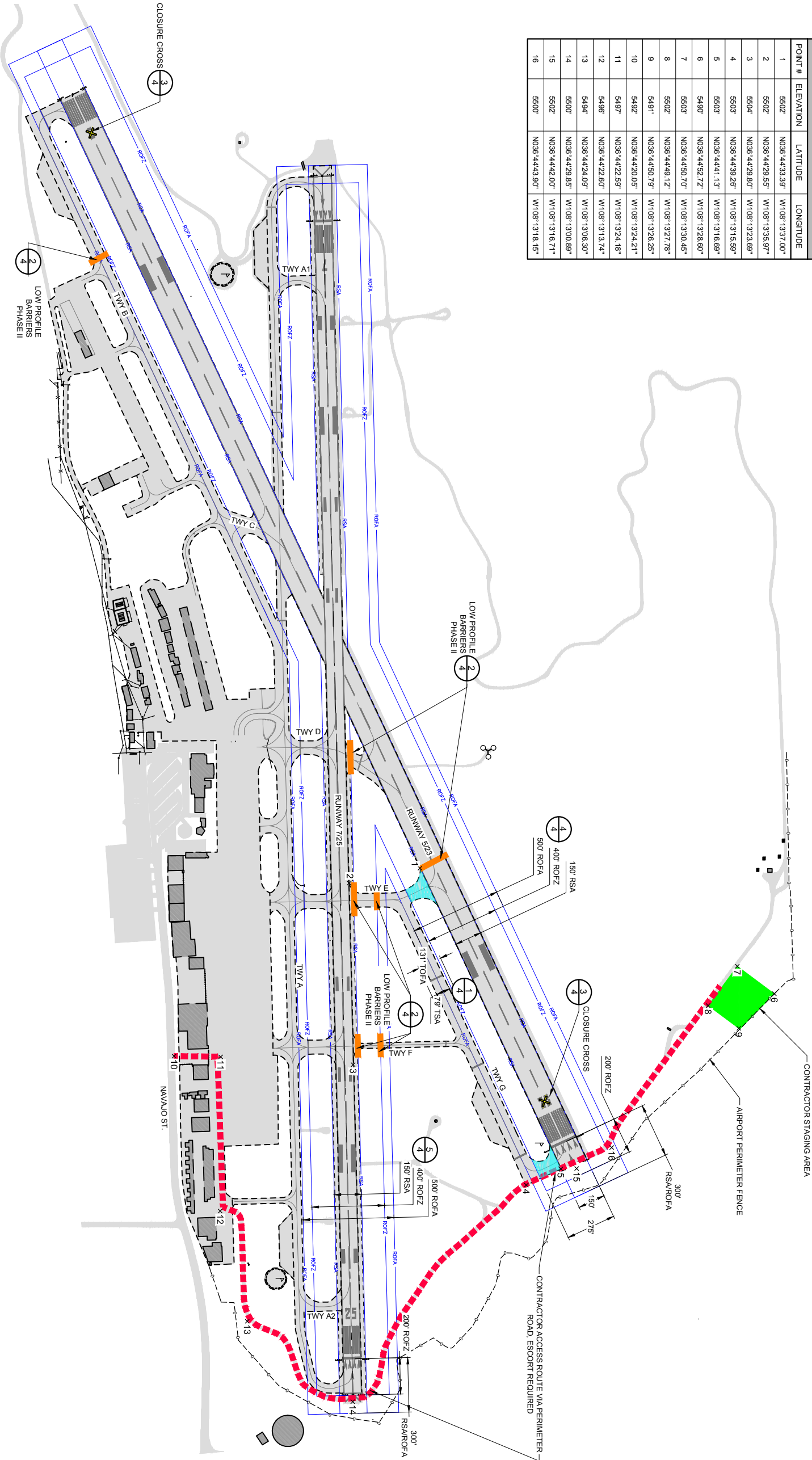
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PLANNING ENGINEERING CONSTRUCTION

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WORK AREAS COORDINATES			
POINT #	ELEVATION	LATITUDE	LONGITUDE
1	5502	N036°44'33.39"	W108°13'37.00"
2	5502	N036°44'29.55"	W108°13'35.97"
3	5504	N036°44'29.80"	W108°13'23.69"
4	5503	N036°44'39.26"	W108°13'15.59"
5	5503	N036°44'41.13"	W108°13'16.69"
6	5490	N036°44'52.72"	W108°13'28.60"
7	5503	N036°44'50.70"	W108°13'30.45"
8	5502	N036°44'49.12"	W108°13'27.78"
9	5491	N036°44'50.79"	W108°13'28.25"
10	5492	N036°44'20.05"	W108°13'24.21"
11	5497	N036°44'22.59"	W108°13'24.18"
12	5496	N036°44'22.60"	W108°13'13.74"
13	5494	N036°44'24.09"	W108°13'06.30"
14	5500	N036°44'29.85"	W108°13'00.89"
15	5502	N036°44'42.00"	W108°13'16.71"
16	5500	N036°44'43.90"	W108°13'18.15"



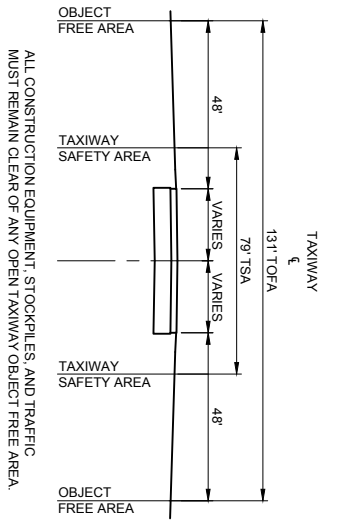
- PHASE II
- RUNWAY 5/23 WILL REMAIN CLOSED AND RUNWAY 7/25 WILL REMAIN OPEN DURING CONSTRUCTION.
 - WORK WILL BE ALLOWED TO TAKE PLACE WITHIN THE RSA AND ROFZ OF RUNWAY 5/23 WITHIN THE DESIGNATED PROJECT AREA DURING CLOSURE.
 - ALL PERSONNEL, VEHICLES, EQUIPMENT, AND MATERIALS SHALL REMAIN CLEAR OF THE RUNWAY SAFETY AREA (RSA) OF RUNWAY 7/25 AT ALL TIMES UNLESS ESCORTED BY AIRPORT PERSONNEL.
 - EQUIPMENT, VEHICLES, AND MATERIALS SHALL NOT BE LEFT UNATTENDED WITHIN THE RUNWAY OBSTACLE FREE ZONE (ROFZ) OF RUNWAY 7/25 AT ANY TIME.
 - LOW PROFILE BARRICADES SHALL BE PLACED ON THE RSA AND ROFZ LINES AS SHOWN.
 - CLOSURE X'S SHALL BE PLACED AS SHOWN.
 - RUNWAY 5/23 SHALL NOT BE REOPENED UNTIL THE RSA AND ROFZ HAVE BEEN REESTABLISHED TO ITS PRE-CLOSURE CONDITIONS.

- LEGEND
- PHASE II WORK AREA (RUNWAY 5/23 CLOSED, RUNWAY 7/25 OPEN)
 - CONTRACTOR STAGING AREA
 - LOW PROFILE BARRIER
 - CONTRACTOR HAUL ROUTE
 - DETAIL #
 - SHEET #
- ROFA = RUNWAY OBJECT FREE AREA
ROFZ = RUNWAY OBSTACLE FREE ZONE
RSA = RUNWAY SAFETY AREA
TOFA = TAXIWAY OBJECT FREE AREA
TSA = TAXIWAY SAFETY AREA

No.	Revision	Date	By

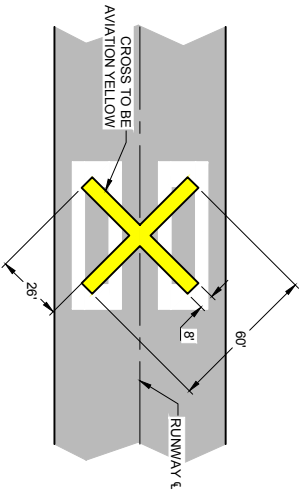
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1 SAFETY AREAS TAXIWAY E, F AND G

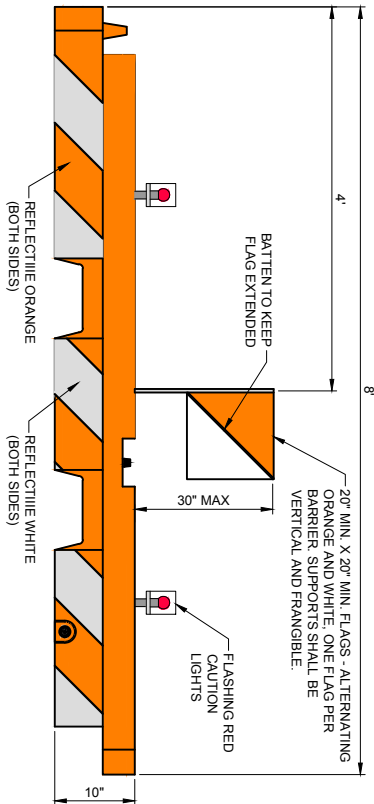
4 NOT TO SCALE



3 RUNWAY CLOSURE CROSS

4 NOT TO SCALE

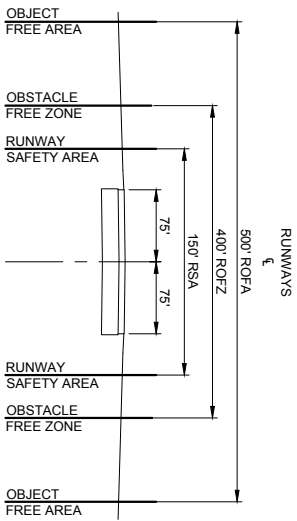
NOTE:
CONTRACTOR SHALL COORDINATE AND USE THE AIRPORT'S LIGHTED CLOSURE CROSSES. THE CONTRACTOR SHALL PLACE ONE MARKER OVER THE RUNWAY DESIGNATION NUMBERS EACH END FOR THE ENTIRE TIME THAT THE RUNWAY IS CLOSED. THE CONTRACTOR SHALL ENSURE THAT THE CROSSED ARE SECURELY ANCHORED SO THEY WILL NOT MOVE DURING HEAVY WIND.
THE CONTRACTOR SHALL PROVIDE ALL FUEL, OIL, LAMPS, AND ANY OTHER MAINTENANCE REQUIRED DURING THE PROJECT. ANY DAMAGE RESULTING FROM THE CONTRACTOR'S NEGLIGENCE SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT NO COST TO THE AIRPORT. THE LIGHTED CROSSES SHALL BE TRANSPORTED ON APPROVED AIRPORT SURFACES ONLY. THE CROSSED SHALL BE STORED AT THE LOCATION DESIGNATED BY THE AIRPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PORTABLE TRAILER MOUNTED EQUIPMENT AND COST FOR USE OF THE TRANSPORTATION, OPERATION, AND MAINTENANCE OF THE LIGHTED CLOSURE CROSSES SHALL BE INCIDENTAL TO THE PROJECT.



2 LOW PROFILE SAFETY BARRIER

4 NOT TO SCALE

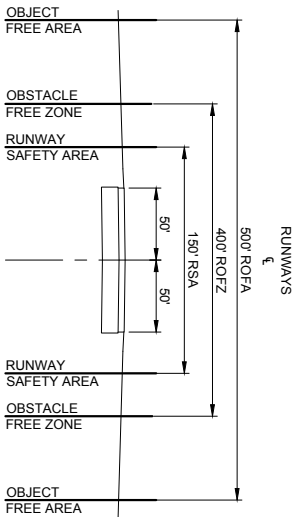
- NOTES:
1. BARRIER SHALL BE SHERWIN INDUSTRIES, 10' x 96" LOW PROFILE AIRPORT BARRIER, AS SHOWN, OR APPROVED EQUAL.
 2. THE ENTIRE AREA OF ORANGE AND WHITE STRIPES SHALL BE REFLECTORIZED WITH SMOOTH SURFACE TYPE REFLECTIVE SHEETING.
 3. LIGHTS MUST BE MOUNTED ON BARRIERS AND SPACED AT NO MORE THAN 10 FT.
 4. THE BARRIERS SHALL BE WEIGHTED AGAINST PROPWASH AND CAPABLE OF WITHSTANDING UP TO 100 M.P.H. WIND FORCES.
 5. FLASHING RED CAUTION LIGHTS SHALL BE BATTERY OPERATED AND SHALL MAINTAIN SUCH INTENSITY SO AS TO BE READILY IDENTIFIED FROM DISTANCES OF AT LEAST 200 FEET DURING DARKNESS.
 6. THE CONTRACTOR SHALL CHECK ALL BARRIERS AND LIGHTS EACH DAY BEFORE LEAVING THE AIRPORT TO ENSURE LIGHTS ARE WORKING PROPERLY AND MAY NOT LEAVE WITHOUT ALL BARRIERS AND LIGHTS BEING IN PROPER WORKING ORDER.



ALL STATIONARY CONSTRUCTION EQUIPMENT AND STOCKPILES MUST REMAIN CLEAR OF ANY OPEN RUNWAY OBJECT FREE AREA. ALL CONSTRUCTION EQUIPMENT AND TRAFFIC MUST REMAIN CLEAR OF ANY OPEN RUNWAY OBSTACLE FREE ZONE.

4 SAFETY AREAS RUNWAY 5/23

4 NOT TO SCALE



ALL STATIONARY CONSTRUCTION EQUIPMENT AND STOCKPILES MUST REMAIN CLEAR OF ANY OPEN RUNWAY OBJECT FREE AREA. ALL CONSTRUCTION EQUIPMENT AND TRAFFIC MUST REMAIN CLEAR OF ANY OPEN RUNWAY OBSTACLE FREE ZONE.

5 SAFETY AREAS RUNWAY 7/25

4 NOT TO SCALE

FOUR CORNERS REGIONAL AIRPORT
FARMINGTON, NEW MEXICO

A.I.P. NO. 3-35-0016-039-2016
2016 IMPROVEMENTS



ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

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CONSTRUCTION
SAFETY &
PHASING
PLAN DETAILS

Drawn: SAT
Checked: EFR
Approved: TJA

Project No: 166351
Date: MARCH 2016
File Name: 16635150

No.	Revision	Date	By

21. SAFETY PLAN COMPLIANCE DOCUMENT

I, _____, (CONTRACTOR), have read the Four Corners Regional Airport A.I.P. Project No. 3-35-0016-039-2016 Construction Safety and Phasing Plan (CSPP), approved on _____, and will abide by it as written and with the following additions as noted:

Notes:

1. *If no supplemental information is necessary for any specific section, write "NO SUPPLEMENTAL INFORMATION"*
2. *Do not duplicate information in the CSPP.*

COORDINATION – Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors

1. PHASING – Discuss proposed construction schedule elements including:

- a. Duration of each phase
- b. Daily start and finish of construction, including "night only" operation
- c. Duration of construction activities during:
 - i. Normal runway operations
 - ii. Closed runway operations
 - iii. Modified runway "Aircraft Reference Code" usage

2. AREAS AND OPERATIONS AFFECTED BY THE CONSTRUCTION ACTIVITY – Areas and operations are identified in the CSPP

NO SUPPLEMENTAL INFORMATION

3. PROTECTION OF NAVAIDS – Discuss specific methods proposed to protect operating NAVAIDS

4. CONTRACTOR ACCESS – Provide the following:

- a. Details on how the integrity of the airport security fence will be maintained (gate guards, daily log of construction personnel, or other
- b. List individuals required for driver training (as required)
- c. Radio communications
 - i. Types of radios and backup capabilities
 - ii. Who will be monitoring radios
 - iii. Whom to contact if ATCT cannot reach the contractor's designated person by radio
- d. Details on how material delivery vehicles will be escorted on site

5. WILDLIFE MANAGEMENT – Discuss the following:

- a. Methods and procedures to prevent wildlife attraction
- b. Wildlife reporting procedures

6. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT – Discuss equipment and methods for controlling FOD, including construction debris and dust

7. HAZARDOUS MATERIAL (HAZMAT) MANAGEMENT – Discuss equipment and methods for responding to hazardous spills

8. 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
- d. Batch plant details

9. INSPECTION REQUIREMENTS – Discuss daily (or more frequent) inspections and special inspection procedures

10. UNDERGROUND UTILITIES – Discuss proposed methods of identifying and protecting underground utilities

11. PENALTIES – Penalties are identified in the CSPP

NO SUPPLEMENTAL INFORMATION

12. SPECIAL CONDITIONS – Discuss proposed actions for each special condition identified in the CSPP

13. RUNWAY AND TAXIWAY VISUAL AIDS – Discuss proposed visual aids (marking, lighting, signs, and visual NAVAIDs) 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. Types of temporary Visual Guidance Slope Indicators (VGSI)
-
-
-

14. MARKING AND SIGNS FOR ACCESS ROUTES – Discuss proposed methods of demarcating access routes for vehicle drivers

15. HAZARD MARKING AND LIGHTING – Discuss proposed equipment and methods for identifying excavation areas

16. PROTECTION OF RUNWAY AND TAXIWAY SAFETY AREAS – Discuss proposed methods of identifying, demarcating, and protecting airport surfaces (safety areas, object free areas, obstacle free zones, and approach/departure zones) including:

- a. Equipment and method for maintaining Runway or Taxiway Safety Area standards
 - b. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
-
-
-

17. OTHER LIMITATIONS ON CONSTRUCTION – Other limitations (if any) shall be identified in the CSPP

NO SUPPLEMENTAL INFORMATION

This Safety Plan Compliance Document (SPCD) must be submitted and approved by the Sponsor prior to issuing the Notice to Proceed for Construction. The contractor should allow at least two weeks for review by the Sponsor.

_____ (CONTRACTOR) certifies that it understands the operational safety requirements of the CSPP and will not deviate from the approved CSPP and this SPCD unless written approval is granted by the Sponsor. It is our understanding that upon review and approval of this SPCD, we may request issuance of Notice to Proceed.

By _____, _____, _____
Title Date

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U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: Painting, Marking, and Lighting of
Vehicles Used on an Airport

Date: April 1, 2010

AC No: AC 150/5210-5D

Initiated by: AAS-100

Change:

1. **PURPOSE.** This advisory circular (AC) provides guidance, specifications, and standards for painting, marking, and lighting of vehicles operating in the airport air operations area (AOA). The approved lights, colors, and markings herein assure the conspicuity of vehicles operating in the AOA from both the ground and the air.

2. **CANCELLATION.** This AC cancels AC 150/5210-5C, Painting, Marking, and Lighting of Vehicles Used on an Airport, dated August 31, 2007.

3. **APPLICATION.** The Federal Aviation Administration (FAA) recommends the guidelines and standards in this Advisory Circular for vehicles operating in the airport AOA. In general, use of this AC is not mandatory. *However*, use of this AC is mandatory for vehicles funded with federal grant monies through the Airport Improvement Program (AIP) and/or with revenue from the Passenger Facility Charges (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications."

Vehicles covered by this AC that do not meet this standard may be used until the vehicle is repainted or replaced, but no later than **December 31, 2010**.

4. **PRINCIPAL CHANGES.** This AC contains new specifications and recommendations for the painting, marking, and lighting of Towbarless Tow Vehicles (TLTVs).

5. **METRIC UNITS.** To promote an orderly transition to metric units, this AC includes both English and metric dimensions. The metric conversions may not be exact equivalents, and until there is an official changeover to the metric system, the English dimensions will govern.

6. **COMMENTS OR SUGGESTIONS** for improvements to this AC should be sent to:

Manager, Airport Engineering Division
Federal Aviation Administration
ATTN: AAS-100
800 Independence Avenue, S.W.
Washington, DC 20591

Michael J. O'Donnell
Director of Airport Safety and Standards

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PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT

1. SOURCES OF APPLICABLE DOCUMENTS.

- a.** American National Standards Institute, Inc. (ANSI), 25 West 43rd St. 4th Floor, New York, NY 10036. Website: **www.ansi.org**
- b.** American Society for Testing & Materials (ASTM), ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. Website: **www.astm.org**
- c.** The National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, Massachusetts 02169-7471. Website: **www.nfpa.org**
- d.** The U. S. General Services Administration (GSA), Centralized Mailing List Services, 501 West Felix Street, Whse 9, South End P.O. Box 6477, Fort Worth, Texas 76115-6477. Website: **www.gsa.gov**
- e.** The Superintendent of Documents, U.S. Government Printing Office, 732 North Capitol St. NW, Washington, DC 20401.
- f.** Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001. Website: **www.sae.org**
- g.** FAA Advisory Circulars: U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Ave., Landover, MD 20785. Website: **www.faa.gov**
- h.** FAA Engineering Briefs: **www.faa.gov/airports/engineering/engineering_briefs/**

2. DEFINITIONS. The following definitions apply in this AC:

- a. Vehicle** – All conveyances, except aircraft, used on the ground to transport persons, cargo, equipment or those required to perform maintenance, construction, service, and security duties.
- b. Air Operations Area (AOA)** – The portion of airport that encompasses the landing, take off, taxiing, and parking areas for aircraft.
- c. Airport Emergency Vehicles** – Vehicles that are authorized in the AOA for emergency purposes (e.g., ambulances, aircraft rescue and fire fighting (ARFF) vehicles and emergency response vehicles) as authorized by the airport traffic control tower (ATCT) or an authorized on-site accident/incident commander.
- d. Airport Operations Vehicles** – Vehicles routinely used by airport operations personnel for airport inspection and duties associated with airfield operations (such as airfield condition reporting and Incident Command) on the AOA and Movement Area.
- e. Airport Security Vehicles** – Vehicles that are authorized in the AOA for security purposes, as needed (e.g. police cars).

- f. Airfield Service Vehicles** – Vehicles that are routinely used in the AOA for airfield service, maintenance, or construction (e.g. snow blowers, snowplows, maintenance trucks, and tractors).
- g. Aircraft Support Vehicles** – Vehicles that are routinely used in the AOA to support aircraft operations (e.g. aircraft pushback tractors, baggage/cargo tractors or trucks, air conditioning and aviation fuel trucks). These vehicles are typically owned by airlines, vendors, or contractors and are not eligible for Federal funding.
- h. Reduced Visibility** – Prevailing visibility is less than one statute mile (1609 meters) and/or the runway visual range (RVR) is less than 6,000 feet (1830 meters).
- i. Movement Area** – The runways, taxiways, and other areas of an airport/heliport that are used for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with an operating airport traffic control tower (ATCT), specific approval for entry onto the movement area must be obtained from air traffic control (ATC).
- j. Other Vehicles** – Vehicles that are not routinely authorized in the AOA (e.g. construction vehicles). These vehicles are typically owned by airlines, vendors, or contractors and are not eligible for Federal funding.
- k. Peak Intensity** – Peak intensity, for purposes of this document, means the maximum magnitude of luminescence as measured in candela.
- l. Towbarless Tow Vehicle (TLTV)** – a type of aircraft support vehicle whose main purpose is to tow aircraft in the AOA by way of nose gear capture.

3. VEHICLE PAINTING.

NOTE: *Airport vehicle paint and markings are a safety of flight requirement. The approved colors/markings herein assure conspicuity of vehicles operating in the AOA from both the ground and air.*

a. Airport Emergency Vehicles.

(1) Ambulances. Ambulance vehicles are painted per the most current version of Federal Specification KKK-A-1822, *Federal Specification for the Star-of-Life Ambulance*. Ambulances are not considered vehicles routinely operating on the AOA.

(2) Aircraft Rescue and Fire Fighting (ARFF) Vehicles. Yellowish-green is the vehicle color standard. Color specifications are per Appendix A.

NOTE: *A yellowish-green color provides optimum visibility during all light levels encountered during a 24-hour day and under variations of light that result from weather and seasonal changes.*

b. Airport Operations Vehicles. Airport operations vehicles may be painted in colors designated by the airport operator. The characteristics must be coordinated with the respective ATCT and identified in the tower letter of agreement.

c. Airport Security Vehicles. Comply with specific state or local requirements.

d. Airfield Service Vehicles. Chrome yellow is the vehicle color standard. Color specifications are per Appendix A. When vehicles are equipped with bumper bars 8 inches (200 mm) or more in depth, the bars must be painted in alternate stripes 4 inches (100 mm) in width of chrome yellow and black inclined 45° to the vertical.

e. Aircraft Support Vehicles.

(1) Any color or combination of colors other than yellowish-green or chrome yellow. The bumper bar paint scheme in paragraph 3.d (of alternating chrome yellow and black stripe) is recommended.

(2) **TLTVs.** International orange is the vehicle color standard. Retroreflective tape covering more than 25 percent of the vehicle's vertical surfaces may be used as a temporary measure to meet this standard prior to scheduled vehicle painting.

f. Other Vehicles. Any color or combination of colors other than solid black or white.

4. VEHICLE MARKING.

a. Airport Emergency Vehicles.

(1) **Ambulances.** Ambulances are marked per the most current version of Federal Specification KKK-A-1822.

(2) **ARFF Vehicles.** Emergency rescue and fire fighting vehicles are marked with the letters "ARFF," "Fire," or "Rescue" and in accordance with 4.c.(1)-(5) of this AC.

b. Airport Operations Vehicles. Airport operations vehicles may be marked as designated by the airport operator. Marking must be coordinated with the respective ATCT and identified in the tower letter of agreement.

c. Airfield Service Vehicles and Aircraft Support Vehicles.

(1) Airport operator owned vehicles must display an identification number on each side and on the roof (the hood should be used if the vehicle has no roof).

(2) Side numbers will be a minimum of 16 inches (410 mm) in height and conspicuously located.

(3) Roof numbers will be a minimum of 24 inches (610 mm) in height and affixed with their bases toward the front of the vehicle. The identification numbers should provide sharp color contrast to the vehicle color.

(4) In addition to the identification numbers, airport operator-owned vehicles must display either the name of the airport and/or the airport insignia.

(5) To further improve night-time recognition of vehicles, a minimum 8 inch (200 mm) wide horizontal band of high gloss white paint or white reflective tape (Retroreflective, ASTM-D 4956-09, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Type III & above) must be used around the vehicle's surface. Figures 1, 2, and 3 show suggested locations for the horizontal reflective band.

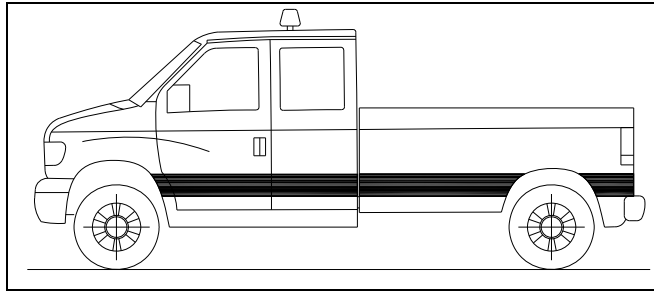


Figure 1: Suggested location for the horizontal reflective band, Option 1

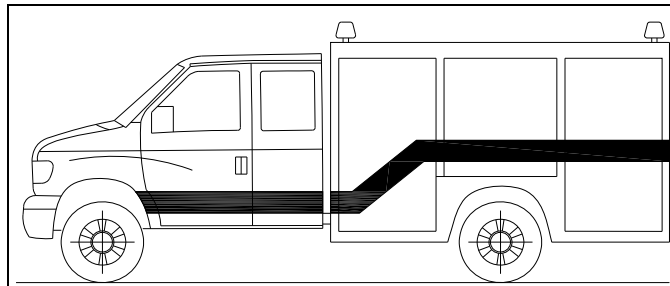


Figure 2: Suggested location for the horizontal reflective band, Option 2

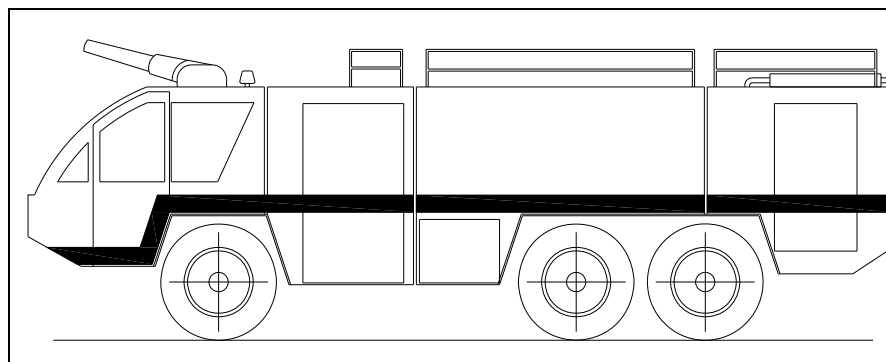


Figure 3: Suggested location for the horizontal reflective band, Option 3

(6) TLTVs. Retroreflective tape is used to outline the shape of a TLTV. If the vertical edge of the vehicle is rounded, the tape should be placed on the rounded portion to reflect light in both the horizontal and vertical planes. Where the placement of the tape may interfere with, or may be worn down by, maintenance or operational activities, tape is not required. Suggested locations for the retroreflective bands are shown in Figure 4.

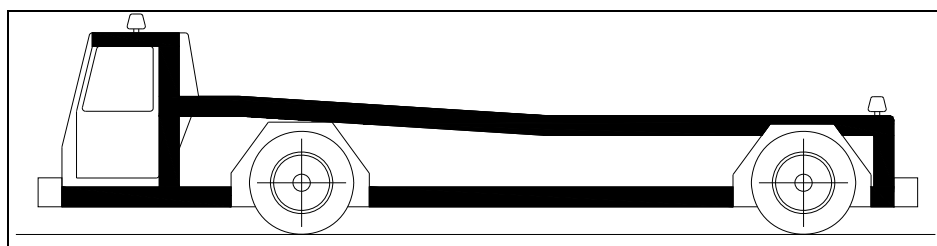


Figure 4: Suggested placement of retroreflective tape on a TLTV

d. Airport Security and Other Vehicles.

- (1) Vehicles other than those that routinely traverse any portion of the AOA under the control of ATC, which are not escorted by a vehicle in constant two-way radio communication with ATC and properly equipped and authorized to operate in the AOA, must be provided with a flag on a staff attached to the vehicle so that the flag will be readily visible.
- (2) At airports without air traffic control facilities, flags must be provided on all vehicles.
- (3) The flag must be at least a 3-foot by 3-foot (0.9 meter by 0.9 meter) square having a checkered pattern of international orange and white squares at least 1 foot (300 mm) on each side (see Appendix A for the fabric color specification).

5. VEHICLE LIGHTING.

a. Airfield Service, Aircraft Support, and Airport Operations Vehicles.

- (1) The standard for identification lighting is a yellow flashing light that is mounted on the uppermost part of the vehicle structure. A steady yellow light designates vehicles limited to non-movement areas.
- (2) The light must be visible from any direction, day and night, including from the air.
- (3) Color specifications for vehicle identification lights are per Appendix B.
- (4) **TLTVs.** An LED light bar placed above the operator's cab may be used in place of the rotating yellow flashing light. In addition, a yellow flashing light (of any type) must be installed on the upper left-rear and right-rear corners of the TLTV, and must be activated when an aircraft is in tow. The size of the rear flashing lights must be large enough to meet the requirements of Section 5.c, but not so large as to interfere with the normal or towing operations of the TLTV.

b. Airport Emergency, Security, and Other Vehicles, which are not escorted by a properly lighted vehicle, must be identified during periods of low visibility by a light.

c. Characteristics of Flashing Lights:

- (1) Ambulance lights must meet the specifications in the most current version of Federal Specification KKK-A-1822, and ARFF vehicles must meet NFPA, state, and local requirements.
- (2) Lights must have peak intensity within the range of 40 to 400 candelas (effective) from 0° (horizontal) up to 10° above the horizontal and for 360° horizontally. The upper limit of 400 candelas (effective) is necessary to avoid damage to night vision.
- (3) From 10° to 15° above the horizontal plane, the light output must be 1/10th of peak intensity or between 4 and 40 candelas (effective).

- (4) Lights must flash at 75 ± 15 flashes per minute.

NOTES:

- 1. The effective intensity of a flashing light is equal to the intensity of a steady-burning (fixed) light of the same color that produces the same visual range under identical conditions of observation.*
- 2. If xenon flashtubes are used, refer to AC 150/5345-43, Specification for Obstruction Lighting Equipment, for guidance concerning methods of calculating effective intensity.*

d. Light Colors.

(1) Airport Emergency Vehicles.

(a) **Ambulances.** Per the most current version of Federal Specification KKK-A-1822.

(b) **ARFF Vehicles.** Red or a combination of red-and-white flashing lights per the chromaticity requirements in Appendix B.

(2) Airport Security Vehicles. Signal blue or a combination of red and signal blue flashing light per the chromaticity requirements in Appendix B.

(3) Airfield Service, Aircraft Support, Airport Operations, and Other Vehicles. Yellow flashing light per the chromaticity requirements in Appendix B.

APPENDIX A. COLOR SPECIFICATIONS

A-1. SPECIFICATIONS. Colors specified in Table A-1 are per the Commission Internationale de l'Eclairage (CIE) L*a*b* system of color specification. For a description of this system, refer to American Society for Testing & Materials (ASTM) D 2244, *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*.

Table A-1. Specification for vehicle and flag colors

Standard Illuminant D65 Usage	Chrome Yellow			Yellowish-Green			International Orange		
	Vehicle Paint			Vehicle Paint			Vehicle Paint / Flag Fabric		
CIELAB DATA	L*	a*	b*	L*	a*	b*	L*	a*	b*
Centroid Color	72.8	24.4	77.6	78.3	-10.2	80.4	45.0	53.5	52.0
Point 1	72.8	31.8	82.9	78.3	-9.0	92.0	45.0	61.4	47.8
Point 2	72.8	25.5	66.7	78.3	-7.6	73.2	45.0	53.9	41.4
Point 3	72.8	18.0	69.3	78.3	-11.0	69.3	45.0	53.5	53.4
Point 4	72.8	22.4	86.0	78.3	-13.4	86.2	45.0	49.7	60.4
Light Limit	77.8			83.3			49.9		
Dark Limit	67.8			73.3			41.6		
Max ΔE	11.1			11.7			10.7		

A-2. COLOR TESTS. Acceptable colors are those that meet the gloss rating test and either a visual or an instrumental color test as follows:

NOTE: *Flag fabric colors must meet either the instrumental tests in Table A-1 or the visual method described in paragraph A-2b(1).*

a. Gloss Rating Test. This test is performed per ASTM D 523, *Standard Test Method for Specular Gloss*, on a paint sample of the color to be applied on the vehicle. An acceptable color sample is high gloss with a minimum gloss rating of 70 units, for 60° geometry.

b. Color Test Methods:

(1) Visual. Prepare a master specimen of the color (per Table A-1) and gloss (per paragraph A-2a). This specimen will be the master color and be used as the basis of comparison per ASTM D 5531-05, *Standard Guide for the Preparation, Maintenance, and Distribution of Physical Product Standards for Color and Geometric Appearance of Coatings*. To verify the paint color of a vehicle visually, vehicle paint samples must be

prepared and viewed per ASTM D 1729-96 (Reapproved 2009), *Standard Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials*.

(2) Instrumental. This test requires a test specimen sample and reference to Table A-1. All test specimen measurements should be conducted per ASTM E 1164-09a *Standard Practice for Obtaining Spectrometric Data for Object-Color Evaluation*. Test specimen tolerances must be per Table A-1 per the following:

(a) Plot the centroid color using the a^* and b^* CIELAB coordinate data from Table A-1 on graph paper or by entry of the coordinate data into a computer program. Plot and connect points 1 through 4 from the same table to form a quadrilateral; noting that the centroid color is within this figure. See Figure A-1 for plots of all three color specifications in Table A-1.

(b) Perform color sample measurements per ASTM E 1164-09a. If necessary, convert measurements to CIELAB L^* , a^* , and b^* color space. See ASTM E 308-08, *Standard Practice for Computing the Colors of Objects by Using the CIE System*, for color space conversion formulae.

(c) An acceptable color is one that meets:

(i) the chromaticity requirements of the color samples a^* and b^* CIELAB coordinate data by falling within the quadrilateral;

(ii) the L^* data lightness requirement by falling within the range defined by the light and dark data of Table A-1;

(iii) the total color difference (ΔE) by not exceeding the limits in Table A-1 when the CIELAB data are computed in the following formula:

$$\Delta E = (\Delta L^{*2} + \Delta a^{*2} + \Delta b^{*2})^{\frac{1}{2}}$$

where ΔL^* , Δa^* , and Δb^* values are the differences between those values for the centroid color in Table A-1 and those of the color sample measurements.

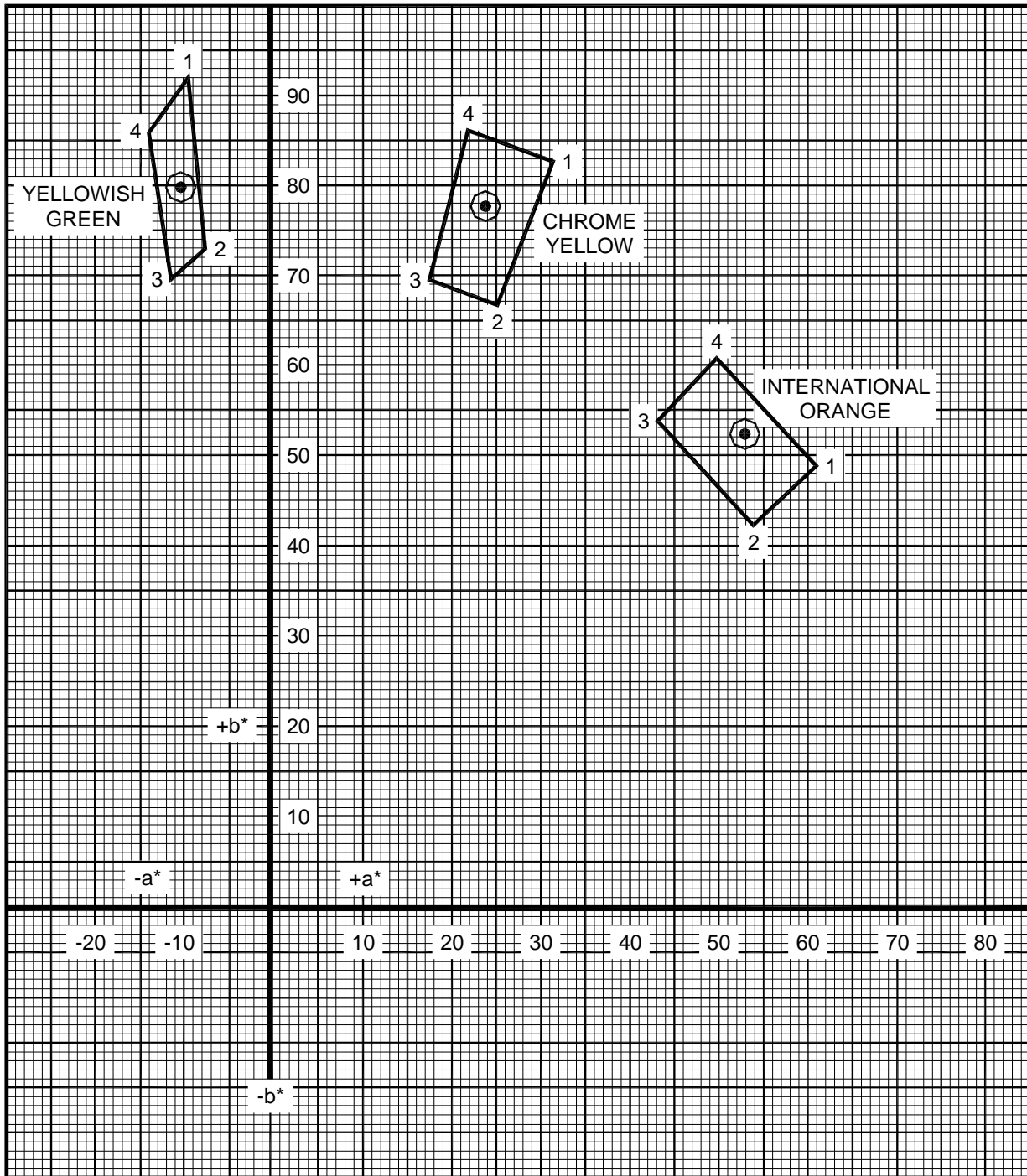


Figure A-1. Plot of selected color paint specifications

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APPENDIX B. COLOR SPECIFICATIONS FOR VEHICLE IDENTIFICATION LIGHTS

B-1. SPECIFICATIONS. The Society of Automotive Engineers (SAE) Standard J578 Revised December 2006, *Color Specification*, defines the acceptable color boundary limits and measurement of emitted red, white, signal blue, and yellow light for vehicle lights. This standard applies to the overall emitted color of light from the device in lieu of emitted light from any small area of the lens. The color of emitted light must fall within the color boundaries per SAE J578 Revised December 2006 (color boundary equations are in the standard) using color measurement methods detailed in the standard. See FAA Engineering Brief #67, Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures, for additional information and Alternative Lighting Devices.

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: GROUND VEHICLE OPERATIONS ON AIRPORTS

Date: March 31, 2008

AC No: 150/5210-20

Initiated by: AAS-300

Change: 1

1. PURPOSE. This Advisory Circular (AC) and the attached appendices provide guidance to airport operators in developing training programs for safe ground vehicle operations and pedestrian control on the airside of an airport. This includes both movement and non-movement areas, ramps, and aprons. Not all the items addressed in this document will be applicable at every airport. The Federal Aviation Administration (FAA) recommends that each item be evaluated in terms of how it may apply to the size, complexity, and scope of operation of the airport. This AC contains recommended operating procedures, a sample training curriculum (Appendix A), and a sample training manual (Appendix B).

2. BACKGROUND. Every year there are accidents and incidents involving aircraft, pedestrians, and ground vehicles at airports that lead to property damage and injury, which may be fatal. Many of these events result from inadequate security measures, a failure to maintain visual aids, a lack of such aids, and inadequate vehicle operator training. Ground vehicle operation plans promote the safety of airport users by helping identify authorized areas of vehicle operation, outlining vehicle identification systems, addressing vehicle and operator requirements, and coordinating construction, maintenance, and emergency activities.

3. APPLICABILITY. The overall responsibility for the operation of vehicles on an airport rests with the airport operator. The airport operator is also responsible for compliance with the requirements of part 139 at certificated airports and with the provisions of any applicable Federal grant agreements. Adherence to the provisions contained in this AC may materially assist the airport operator in complying with these requirements.

a. All airport operators should establish procedures and policies concerning vehicle access and vehicle operations on the airside of the airport, including ramp and apron areas. These procedures and policies should address such matters as access, vehicle operator requirements, vehicle requirements, operations, and enforcement and should be incorporated into tenant leases and agreements.

b. Establishment of procedures for the safe and orderly access to the movement area and operation in that area is required at certificated airports, under 14 C.F.R. § 139.329(b). Initial and recurrent training in procedures for access to the movement area is required for airport personnel under § 139.303(c). Only initial training is required for tenant and contractor employees, under § 139.329(e). However, regular recurrent training is strongly recommended for all persons with access to the movement area.

c. Each bidding document (construction plans and/or specifications) for development work on an airport or for installation of an air navigation facility (NAVAID) should incorporate a section on ground vehicle operations on airports during construction activity. The airport operator should provide a copy of this plan to the local FAA Airways Facilities office for review. The construction plans and/or specifications should contain the appropriate provisions, as specified in Appendix 1 of AC 150/5370-2, *Operational Safety on Airports During Construction*.

4. RELATED READING MATERIAL. You will find additional information in the following publications:

- a. 14 CFR part 139, Certification of Airports
- b. Current editions of the following advisory circulars:
 - (1) AC 90-67, Light Signals from the Control Tower for Ground Vehicles, Equipment, and Personnel
 - (2) AC 120-57, Surface Movement Guidance and Control System
 - (3) AC 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport
 - (4) AC 150/5340-1, Standards for Airport Markings
 - (5) AC 150/5340-18, Standards for Airport Sign Systems
 - (6) AC 150/5370-2, Operational Safety on Airports During Construction
 - (7) AC 150/5210-18, Systems for Interactive Training of Airport Personnel
 - (8) AC 150/5200-30, Airport Winter Safety and Operations
- c. To view or download an electronic copy of this AC, visit the FAA website at <http://www.faa.gov>.

5. VEHICLE OPERATOR REQUIREMENTS. Vehicle operators on airports face conditions that are not normally encountered during highway driving. Therefore, those persons who have vehicular access to the movement area of the airport must have an appropriate level of knowledge of airport rules and regulations. Airport operators should require vehicle operators to maintain a current driver's license and should establish a means of identification that would permit the operation of a vehicle on the airside of an airport. Any person expected to operate on the movement area should demonstrate a functional knowledge of the English language.

6. TRAINING. Appendix A includes a sample training curriculum. This curriculum should include initial and/or remedial instruction of all personnel who have access to the airside of the airport. The curriculum should also include annual recurrent instruction for all personnel who have access to the movement area. The airport operator should retain records of this training as long as this person is authorized to operate on the airport. Escorted access

does not normally require training. Airport operators may modify these documents to meet their individual needs. It may also be advantageous to develop customized programs for vehicles operators who only access ramp areas and those who operate on the movement area.

Initial training is the training provided to a new employee or airport user that would enable that person to demonstrate the ability to operate a vehicle safely and in accordance with established procedures while functioning independently on the airside. Recurrent training is the training provided to an employee or airport user as often as necessary to enable that person to maintain a satisfactory level of proficiency. Appropriate schedules for recurrent training will vary widely from airport to airport and from one employee to another, however, under no circumstances should recurrent training intervals for personnel authorized to drive on the movement area extend beyond one year. Airport operators might consider requiring annual recurrent training when a vehicle operator renews an expired airport ID badge or when a tenant renews a lease agreement. A sample Ground Vehicle Operating Familiarization Program Training Record is included in Appendix B.

Airports use a variety of methods for training ground vehicle operators. In some cases, airport operators delegate the requirement of employee training to airport tenants or a contractor. Some airport operators choose to include training manuals or vehicle-operating requirements as part of tenant lease or use agreements. An airport operator may choose to distribute training manual information via a Web page, videos, or booklets. Formal classroom instruction provided by the airport operator or tenant can include either personal instruction or a computer-based interactive training system. (See AC 150/5210-18.)

Airport operators should provide a means of testing trainees on the information presented. In addition to standard question and answer classroom testing methods, the airport operators should have potential ground vehicle operators demonstrate their proficiency in operating a vehicle on the airside before authorizing driving privileges. The FAA also recommends on-the-job training before personnel have unescorted access to the airside of the airport.

7. VEHICLES ON AIRPORTS. Airport operators should keep vehicular and pedestrian activity on the airside of the airport to a minimum. Vehicles on the airside of the airport should be limited to those vehicles necessary to support the operation of aircraft services, cargo and passenger services, emergency

services, and maintenance of the airport. Vehicles on the movement area should be limited to those necessary for the inspection and maintenance of the movement areas and emergency vehicles responding to an aircraft emergency on the movement area. Vehicles should use service roads or public roads in lieu of crossing movement areas whenever possible. Where vehicular traffic on airport operation areas cannot be avoided, it should be carefully controlled.

When necessary, runway crossing should occur at the departure runway end rather than the midpoint. In the event of a runway incursion, an aircraft would have more time and runway length to react if the vehicle incursion is at the end of the runway.

Some aspects of vehicle control and identification are discussed below; however, every airport presents different vehicle requirements and problems. Every airport will require individualized solutions to prevent vehicle or pedestrian traffic from endangering aircraft operations. It should be stressed that aircraft ALWAYS have the right-of-way over vehicles when maneuvering on non-movement areas. Aircraft also have the right-of-way on the movement areas, except when the Airport Traffic Control Tower (ATCT) has specifically instructed an aircraft to hold or give way to vehicle(s) on a runway or taxiway.

Vehicles that routinely operate on the airside should be marked/flagged for high daytime visibility and, if appropriate, lighted for nighttime operations. Vehicles that are equipped with marking and lighting devices should escort vehicles that are not marked and lighted. (See AC 150/5210-5.) Vehicles needing intermittent identification should be marked with magnetically attached markers, which are commercially available.

8. VEHICULAR ACCESS CONTROL. The control of vehicular activity on the airside of an airport is of the highest importance. The airport operator is responsible for developing procedures, procuring equipment, and providing training regarding vehicle operations to ensure aircraft and personnel safety. At airports with an operating ATCT, controllers and vehicle operators should use two-way radios to control vehicles when on the movement area. To accomplish this task, the airport operator and the ATCT should develop a letter of agreement outlining standard operating procedures. When there is construction on an airport, whether federally funded or not, the airport operator should follow the ground vehicle practices contained in AC 150/5370-2.

At airports without an operating ATCT, two-way radio control between vehicles and fixed-based operators or other airport users should avoid frequencies used by aircraft. Even with the most sophisticated procedures and equipment, vehicle operators need training to achieve the proficiency to operate safely. The airport operator should give special consideration to training temporary operators, such as construction workers, even if escort service is being provided.

Inadvertent entry by vehicles onto movement and non-movement areas of an airport poses a danger to both the vehicle operator and aircraft that are attempting to land or take off or that are maneuvering on the airport. Methods for controlling access to the airside will vary depending on the type and location of the airport. The Airport Layout Plan is a useful tool for accomplishing this. Airports may erect a fence or provide for other natural or physical barriers around the entire airport in addition to providing control measures at each access gate, such as guards, magnetic card activated locks, or remotely controlled locks. Gates may either be opened/closed electronically or secured by lock and chain. Physical barriers might include natural objects, such as earthen berms, large boulders, tree trunks, and manmade culverts that could help control remote vehicle access points.

9. VEHICLE REQUIREMENTS. Requirements for vehicles will vary depending on the airport, the type of vehicle, and where the vehicle will be operated on the airport. An airport operator should limit vehicle operations on the movement areas of the airport to only those vehicles necessary to support the operational activity of the airport. Airport operators might find it beneficial to have separate requirements for vehicles operated solely on a ramp area as opposed to those vehicles that operate on movement areas.

Some airports have benefited from establishing their own vehicle inspection program to assure that all vehicles are maintained in a safe operating condition. In establishing vehicle requirements, some items to consider include—

- a. Marking and identification of vehicles
- b. Minimum equipment requirements
- c. Inclusion in all vehicles of a placard

diagram depicting the airport's movement area. The diagram should display prominent landmarks and/or perimeter roads. Vehicles intended to operate within the movement area should also include a placard

showing the meaning of ATCT light gun signals and airfield sign and marking information.

d. Vehicle condition requirements and inspection

e. Insurance coverage

10. VEHICLE OPERATIONS. The rules and regulations pertaining to vehicle operations should provide adequate procedures for the safe and orderly operation of vehicles on the airside of the airport. In developing such procedures, airport operators should consider—

a. Requirements that vehicles operating on movement areas be radio equipped or escorted by a radio-equipped vehicle

b. Specific procedural requirements for vehicle operations on airports without an operating ATCT

c. Advance notice/approval for operating a non-airport owned vehicle on the movement area

d. Speed limits

e. Prohibitions on—

(1) Passing other vehicles and taxiing aircraft

(2) Leaving a vehicle unattended and running

(3) Driving under an aircraft except when servicing the aircraft

(4) Driving under passenger bridges

f. Requirements stipulating when vehicle lights must be operated

g. Requirements for the use of dedicated vehicle lanes and perimeter roads whenever possible

h. Locations where vehicles may and may not park

i. Rules of right-of-way (e.g. for aircraft, emergency vehicles, other vehicles)

j. Areas where vehicles may be serviced

k. Procedures for inoperative radios while on a movement area

l. Requirements to report all accidents involving ground vehicles on the airside

m. Requirements making the vehicle operator responsible for passengers in the vehicle

11. EMERGENCY OPERATIONS AND OTHER NON-ROUTINE OPERATIONS. Airport operators allow a number of non-routine operations to occur on the airside of the airport. Such non-routine activities include airfield construction, airshows, aircraft static displays, VIP arrivals/departures, commercial photo shoots, or a host of other activities. In addition to security requirements, airport operators should recognize and prepare for the unique challenges that arise during non-routine operations as they relate to vehicle operations.

Airport operators should review non-routine operations that involve ground vehicles and develop vehicle operation procedures to accommodate these special operations. Planning meetings associated with such activities offer an opportunity to review driving rules and regulations, communications and procedures, and air traffic control procedures as well as other important operational issues.

These meetings should pay special attention to the following activities:

a. **Airside Construction.** The airport operator should develop procedures, procure equipment, and provide training on vehicle operations to ensure aircraft safety during construction as specified in AC 150/5340-2.

b. **Emergency Response/Mutual Aid.** Many airports rely on local emergency services to provide aircraft rescue and firefighting or emergency medical services. Airport operators should ensure that such emergency service providers receive initial and recurrent training in the subject areas identified in paragraph 10, Vehicle Operations, and maintain records of such training. In addition, any mutual aid agreement between the local emergency service providers and the airport operator should specify vehicle operations training requirements.

c. **Snow and Ice Removal.** Airport Operators who use contractors for snow and ice control operations should ensure agreements with such contractors include vehicle operations procedures, including training requirements, consequences of non-compliance, and vehicle communications requirements. The FAA recommends that, when possible, airport operators limit contractors to non-movement areas. When an ATCT is not in operation, or there is no ATCT, procedures should be developed to advise air traffic on the Common Traffic Advisory Frequency (CTAF) of any intentions to remove snow and ice in the movement area.

d. **Low-Visibility Operations.** Additional consideration should be given to vehicle operations

during low visibility. Poor weather conditions (snow, fog, rain, etc.) may obscure visual cues, roadway markings, and airport signs.

Some airports have a Surface Movement Guidance and Control System (SMGCS), which provides guidance to, and control or regulation of, all aircraft and ground vehicles on the movement area of an airport. Guidance relates to facilities, information, and advice necessary to enable pilots of aircraft, or drivers of ground vehicles, to find their way on the airport and keep the aircraft or vehicles on the surfaces and areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows safely. For additional information on the SMGCS and the SMGCS Plan, refer to AC 120-57.

12. SITUATIONAL AWARENESS. There are a number of factors that hamper vehicle operator situational awareness. Situational awareness declines as a driver's attention is drawn into the vehicle or is focused on any one thing to the exclusion of everything else. Other such factors include vague or incomplete communications or a vehicle operator's personal conflicts, which may involve fatigue and stress. Running behind schedule or being over-tasked also contributes to a reduction in situational awareness. Certainly, degraded operating conditions, such as equipment malfunctions, rain, fog, or snow, may also diminish a vehicle operator's situational awareness.

There are ways to enhance situational awareness. As part of a ground vehicle operator's training program, airport operators may concentrate on having vehicle operators visually scan fixed and moving objects that may be converging into the vehicle's path. Airport operators should also promote the use of clear and concise communications by vehicle operators. Most important, airport operators should alert vehicle operators to distractions caused by social interactions while operating a vehicle on the airside.



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Acting Director of Airport Safety and Standards

Airport operators may also be able to increase situational awareness for vehicle operators with enhancements on the airside. Such enhancements may include establishing dedicated marked routes for vehicles that avoid high activity, congested areas, or blind spots. The elimination or relocation of fixed objects that hinder a vehicle operator's line of sight or block radio transmissions may also enhance safety.

13. ENFORCEMENT AND CONTROL. Airport operators should establish procedures for enforcing the consequences of non-compliance, including penalties for violations. Tenant lease or use agreements may include these enforcement provisions. Listed below are control issues that airport operators should address as part of a ground vehicle control program:

- a. Implementation of a tiered identification badging system that permits easy recognition of a vehicle operator's permitted driving area privileges
- b. Prohibition against transfer of registration media to a vehicle other than the one for which originally issued
- c. Policies for surrendering permits to airport management when a vehicle is no longer authorized entry into a facility
- d. Periodic checks to ensure that only properly authorized persons operate vehicles on the airside.
- e. System to control the movement of commercial trucks and other goods conveyances onto and out of the airside of an airport
- f. Briefing or training for delivery drivers if they are permitted direct access to the airside
- g. Implementation of a progressive penalty policy

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APPENDIX A

GROUND VEHICLE ACCESS PROGRAM TRAINING CURRICULUM

NOTE: The purpose of the Ground Vehicle Access Program Training Curriculum is to provide airport operators with a comprehensive list of training topics for educating vehicle operators who may have access to the airside of an airport. Each individual airport has unique situations that might require site-specific training. Airport operators may use this training curriculum as a guide for developing and implementing a detailed training program tailored to the airport's individual situation.

The purpose of a training program is to provide vehicle operators with the level of training necessary for their positions so they are capable of operating safely on the airside of an airport. Specific programs may be tailored to account for the items listed below:

1. Various infield aircraft navigation aids
2. Identification of a given point on a grid map or other standard map used at the airport
3. Applicable airport rules, regulations, or procedures pertaining to vehicle operations
4. Airport layout, including designation of runways and taxiways
5. Boundaries of movement areas

6. Interpretation and color coding of airfield signs, pavement markings, and lighting
7. Location and understanding of critical areas associated with instrument landing system (ILS) and very high frequency omnidirectional ranges (VORs)
8. Proper terminology (including phonetic alphabet) and procedures for radio communications with the airport traffic control tower (ATCT)
9. ATCT light gun signals
10. Established routes for emergency response vehicles
11. Dangers associated with jet blast and prop wash
12. Traffic patterns associated with each runway (left or right) and location of each leg; i.e., downwind, base, final, and crosswind
13. Situational awareness

An airport operator may choose to develop customized training programs for vehicle operators who are restricted to operating ground vehicles only on ramps and apron areas.

AREAS OF TRAINING

All drivers should have training in the following areas:

1. Discussion of Runway Incursions, Airfield Safety, and Security
Training Outcome(s) – Trainee should be able to define a runway incursion and explain the benefits of airfield safety/security.

2. Definitions and Terms
Training Outcome(s) – Trainee should be knowledgeable of the terms used on an airport.

3. Vehicle Operating Requirements
 - a. Authorized Vehicles and Vehicle Identification
 - b. Vehicle Lighting
 - c. Vehicle Insurance
 - d. Vehicle Inspection

- e. Vehicle Parking
- f. Accident Reporting
- g. Perimeter Roadways
- h. Aircraft Lighting
4. Rules and Regulations
 - a. Review
 - b. Noncompliance/Penalties
 Training Outcome(s) – Trainee should be knowledgeable of ground vehicle rules and regulations.

5. Testing
 - a. Written Test
 - b. Practical Test
 Training Outcome(s) – Trainee should be able to pass a written examination with a minimum score of 90 percent.

In addition to items 1–5, instruction for drivers authorized to drive on the movement area should also include those subject areas identified under Airport Familiarization and Communications.

6. Airport Familiarization

- a.** Runway Configuration/Safety Area
- b.** Taxiway Configuration/Safety Area
- c.** Movement Areas and Non-Movement Areas
- d.** Confusing Areas
- e.** Airport Lighting

(1) Runway

- Runway Edge Lights
- Touchdown Zone
- Taxiway Lead-Off Lights
- Threshold
- Runway Approach Light System

(2) Taxiway

- Taxiway Edge Lights
- Taxiway Centerline Lights
- Runway Guard Lights

f. Airfield Signage

- Runway Position Holding Sign
- Taxiway Location Sign
- ILS Critical Area Sign
- Direction Sign
- Distance Remaining Sign

g. Airfield Markings

(1) Runways

- Centerline
- Edge Markings
- Runway ID Numbers
- Threshold Markings

- Hold Short Lines

(2) Taxiways

- Hold Lines
- ILS Hold Line
- Geographic Position Markings
- Centerline
- Edge Markings

(3) ILS Critical Areas

(4) Non-Movement Area Boundary Marking

h. Airport NAVAIDS and Visual Approach Aids

- Location
- Non-interference

Training Outcome(s) – Trainee should be able to label all critical parts on the airport and explain the purpose of all marking, lighting, and signs on the airport.

7. Communications

a. Ground Vehicle Communications

- (1) Radio Frequencies**
- (2) Procedural Words and Phrases**

b. Aviation Phonetic Alphabet

c. Aviation Terminology

d. Procedures for Contacting the ATCT

e. Airfield Communications at Airports Without Operating ATCT

f. Light Gun Signals

- Description of Light Gun and How to Signal Tower

g. Lost Communications Procedures

Training Outcome(s) – Trainee should be able to adequately send and receive radio messages.

APPENDIX B

SAMPLE GROUND VEHICLE OPERATIONS TRAINING MANUAL

NOTE: This sample training manual provides airport operators with a template for developing and implementing proposed policies or procedures for controlling ground vehicles and equipment accessing the airside of an airport. Airport operators may use the format below but adapt the requirements to specific conditions found on the airport. The first part of the appendix could serve as driving rules and regulations that could be adopted by the airport operator who would fill in the appropriate blanks or blocks of text or revise the document for a specific airport. Section 2 would serve as a suggested driver training manual. In this section, the airport operator could add or delete information as it applies to the airport. For example, if the airport has no instrument approach, reference to the ILS signs and protection of critical areas could be deleted. Also, the airport operator is encouraged to replace illustrations of signs with those found on the airport.

Section 1. Airport Driving Rules and Regulations

1.1. Authority for Implementation of Rules and Regulations. The (NAME) Airport operates under the authority of (JURDISTICTION). (CITY/COUNTY ORDINANCE OR STATE STATUTE) has granted the (AIRPORT OPERATOR) the authority to make bylaws for the management and supervision of its airport affairs.

1.2. Applicability. This regulation applies to all users of, and persons on any portion of, the property owned or controlled by (AIRPORT OPERATOR). No persons are exempt from airport operating training requirements for operating a vehicle on the airside of an airport. Tenant organizations shall be responsible for the dissemination of, accessibility to, and compliance with these rules and regulations by their employees.

These Rules and Regulations may be amended, changed, or modified by (AIRPORT OPERATOR), as necessary.

1.3. Definitions. The following terms are defined as indicated in this section for the purpose of this Ground Vehicle Operation Training Manual. *(The airport operator should include only those definitions applicable to its airport and conditions.)*

- 1.3.1 Accident**—a collision between one aircraft or vehicle and another aircraft, vehicle, person, or object that results in property damage, personal injury, or death.
- 1.3.2 Air Carrier Ramp**—a ramp for air carriers. Only authorized personnel and vehicles may operate on this ramp. Private vehicles and aircraft are prohibited from operating on it.
- 1.3.3 Airside**—those areas of an airport that support aircraft activities.
- 1.3.4 Airport Traffic Control Tower (ATCT)**—a service operated by an appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.
- 1.3.5 Aircraft**—a device that is used or intended to be used for flight in the air.
- 1.3.6 Airport**—(NAME) International Airport Facility, owned and operated by (AIRPORT OPERATOR), including all improvements and equipment existing or to be developed.
- 1.3.7 Apron or Ramp**—a defined area on an airport or heliport intended to accommodate aircraft for the purposes of parking, loading and unloading passengers or cargo, refueling, or maintenance.
- 1.3.8 Common Traffic Advisory Frequency (CTAF)**—radio frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating ATCT or when the tower is closed. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency and is identified in appropriate aeronautical publications. (See below for definitions of UNICOM, MULTICOM, and FSS.)
- 1.3.9 Fixed-Based Operator (FBO)**—a person, firm, or organization engaged in a business that provides a range of basic services to general aviation. Services may include the sale and dispensing of fuel, line services, aircraft parking and tie-down, pilot and passenger facilities, airframe and power plant maintenance, aircraft sales and rental, and pilot instruction.

- 1.3.10. Flight Service Station (FSS)**—air traffic facilities that provide pilot briefings, en route communications, and visual flight rules search and rescue services; assist lost aircraft and aircraft in emergency situations; relay air traffic control clearances; originate Notices to Airmen; broadcast aviation weather and National Airspace System information; receive and process instrument flight rules flight plans; and monitor NAVAIDS. In addition, at selected locations, FSSs provide En Route Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise Customs and Immigration of transborder flights.
- 1.3.11. Foreign Object Debris (FOD)**—debris that can cause damage to aircraft engines, tires, or skin from rocks, trash, or the actual debris found on runways, taxiways, and aprons.
- 1.3.12. General Aviation (GA)**—that portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of public convenience and necessity.
- 1.3.13. Ground Vehicle**—all conveyances, except aircraft, used on the ground to transport persons, cargo, fuel, or equipment.
- 1.3.14. ILS Critical Area**—an area provided to protect the signals of the localizer and glideslope.
- 1.3.15. Incursion**—any occurrence at an airport involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in loss separation with an aircraft taking off, intending to take off, landing, or intending to land.
- 1.3.16. Jet Blast**—jet engine exhaust or propeller wash (thrust stream turbulence).
- 1.3.17. Law Enforcement Officer (LEO)**—any person vested with police power of arrest under Federal, state, county, or city authority and identifiable by uniform, badge, and other indication of authority.
- 1.3.18. Light Gun**—a hand-held, directional light-signaling device that emits a bright narrow beam of white, green, or red light, as selected by the tower controller. The color and type of light transmitted can be used to approve or disapprove anticipated pilot or vehicle actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the airport and on the airport movement area.
- 1.3.19. Mobile Fueller**—a vehicle owned and/or operated by authorized agents to pump and dispense Jet A and 100 LL fuel at (AIRPORT). This may include fuel tankers, in-to-plane fueling pumpers, and hydrant carts.
- 1.3.20. Movement Area**—the runways, taxiways, and other areas of an airport that aircraft use for taxiing, takeoff, and landing, exclusive of loading ramps and parking areas, and that are under the control of an air traffic control tower.
- 1.3.21. MULTICOM**—a mobile service not open to public correspondence used to provide communications essential to conduct the activities being performed or directed from private aircraft.
- 1.3.22. Non-movement Areas**—taxiways, aprons, and other areas not under the control of air traffic or at airports without an operating airport traffic control tower.
- 1.3.23. Operator**—any person who is in actual physical control of an aircraft or a motor vehicle.
- 1.3.24. Owner**—a person who holds the legal title of an aircraft or a motor vehicle.
- 1.3.25. Restricted Areas**—areas of the airport posted to prohibit or limit entry or access by the general public. All areas other than public areas.
- 1.3.26. Runway**—a defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length.
- 1.3.27. Runway in Use or Active Runway**—any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways.
- 1.3.28. 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.

- 1.3.29. Surface Movement Guidance and Control System (SMGCS)**—a system comprising the provisions for guidance to, and control or regulation of all aircraft, ground vehicles, and personnel of the airport during low-visibility operations. Guidance relates to facilities and information necessary for pilots and ground vehicle operators to find their way about the airport. Control or regulation means the measures necessary to prevent collisions and to ensure that traffic flows smoothly and efficiently.
- 1.3.30. Taxiways**—those parts of the airside designated for the surface maneuvering of aircraft to and from the runways and aircraft parking areas.
- 1.3.31. Tie Down Area**—an area used for securing aircraft to the ground.
- 1.3.32. Uncontrolled Airport**—an airport without an operating airport traffic control tower or when airport traffic control tower is not operating.
- 1.3.33. UNICOM**—a non-Federal communication facility that may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.
- 1.3.34. Vehicle Service Road**—a designated roadway for vehicles in a non-movement area.
- 1.3.35. Very High Frequency Omnidirectional Range (VOR)**—a ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the National Airspace System.
- 1.3.36. Wake Turbulence**—phenomenon resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

1.4. Severability. If any section, subsection, subdivision, paragraph, sentence, clause, or phrase of these Rules and Regulations or any part thereof is for any reason held to be unconstitutional, invalid, or ineffective by any court of competent jurisdiction or other competent agency, such decision will not affect the validity or effectiveness of the remaining portions of these Rules and Regulations.

1.5. Violation of Rules—Penalties and Suspension of Driving Privileges. Any person who does not comply with any of the provisions of these Rules and Regulations, or any lawful order issued pursuant thereto, will be subject to progressive penalties for repeat violations. These penalties may include denied use of the Airport by (OPERATOR) in addition to the penalties described pursuant to Federal, state, or local authorities. *(The airport operator should tailor this section to discuss its enforcement policies.)*

- 1.5.1.** Penalties for failure to comply with the Airside Vehicular Traffic Regulations shall consist of written warnings, suspension of airside driving privileges, and/or revocation of airside driving privileges. Receipt of _____ written warnings by an operator of a vehicle in any 12-month period will automatically result in suspension of airside driving privileges. Receipt of _____ written warnings in any 12-month period will automatically result in revocation of airside driving privileges.
- 1.5.2.** Based on an evaluation of the circumstances or the severity of a particular incident or incidents, the (AIRPORT OPERATOR) reserves the exclusive right to assess any penalty it deems appropriate at any time to any individual authorized to operate a vehicle on the airside without regard to prior operating history.
- 1.5.3.** Suspension of airside driving privileges shall be no less than _____ calendar days and no greater than _____ calendar days.
- 1.5.4.** The (AIRPORT OPERATOR) will provide a copy of all written warnings issued to an operator to the local manager of the company owning or in possession and control of the vehicle or vehicles involved in the violation(s).

1.6. The (AIRPORT OPERATOR) shall require any individual involved in a runway incursion or other vehicle incident to complete remedial airfield driver training.

1.7. Driver Regulations on the Airside of an Airport.**1.7.1. Vehicle Operator Requirements.**

1. All applicants must satisfactorily complete the applicable driver's training class before receiving an airside driver's license.
2. All applicants must pass the written test with a grade of at least ____ percent. Applicants who do not pass the written test may retake the test after additional study and a ____ day period.
3. Applicants for movement area driving privileges shall be required to successfully complete an airside driving test by a designated representative of (AIRPORT OPERATOR).
4. No vehicle shall be operated on the airside unless—
 - a. The driver is authorized to operate the class of vehicle by an appropriate state-licensing agency or by the driver's employer through a company training/certification program.
 - b. The driver properly displays an approved, airport-issued ID card with the Authorized Driver designation (*if applicable*).
5. No person operating or driving a vehicle on any aircraft ramp shall exceed a speed greater than ____ miles per hour. Factors including, but not limited to, weather and visibility shall be taken into consideration when determining safe operating speed.
6. No vehicle shall pass another ground vehicle in a designated vehicle roadway.
7. No vehicle shall pass between an aircraft and passenger terminal or passenger lane when the aircraft is parked at a gate position except those vehicles servicing the aircraft. All other vehicles must drive to the rear of the aircraft and shall pass no closer than _____ feet (____ m) from any wing or tail section.
8. Moving aircraft and passengers enplaning or deplaning aircraft shall have the right-of-way at all times over vehicular traffic. Vehicle drivers must yield the right-of-way.
9. No vehicle operator shall enter the airside unless authorized by (AIRPORT OPERATOR) or unless the vehicle is properly escorted.
10. No vehicle operator shall enter the movement area—
 - a. Without first obtaining permission of the (AIRPORT OPERATOR) and clearance from the ATCT to enter the movement area;
 - b. Unless equipped with an operable two-way radio in communication with the ATCT; or
 - c. Unless escorted by an (AIRPORT OPERATOR) vehicle and as long as the vehicle remains under the control of the escort vehicle.
11. No person shall operate any motor vehicle that is in such physical or mechanical condition as to endanger persons or property or that the (AIRPORT OPERATOR) considers an endangerment.
12. No person shall—
 - a. Operate any vehicle that is overloaded or carrying more passengers than for which the vehicle was designed.
 - b. Ride on the running board or stand up in the body of a moving vehicle.
 - c. Ride with arms or legs protruding from the body of a vehicle except when the vehicle was designed for such use.
13. A vehicle guide person is required whenever the vision of the vehicle operator is restricted.
14. No fuel truck shall be brought into, stored, or parked within 50 feet of a building. Fuel trucks must not be parked within 10 feet from other vehicles.

15. Container carriers and tugs shall tow no more carts, pods, or containers than are practical, under control, tracking properly, and safe.
16. When not serving aircraft or undertaking their intended functions, ramp vehicles and equipment shall be parked only in approved areas.
17. Vehicle operators shall not operate or park vehicles under any passenger loading bridge.
18. No person shall park a vehicle in an aircraft parking area, safety area, or gross area or in a manner that obstructs or interferes with operations in the aircraft movement area or apron area.
19. No person shall park, or leave unattended, vehicles or other equipment that interfere with the use of a facility by others or prevent movement or passage of aircraft, emergency vehicles, or other motor vehicles or equipment.
20. No person shall park a vehicle or equipment within ____ feet (____ m) of a fire hydrant or in a manner that prohibits a vehicle from accessing the fire hydrant.
21. No person shall operate a vehicle or other equipment within the airside under the influence of alcohol or any drug that impairs, or may impair, the operator's abilities.
22. Each vehicle operator using an airport perimeter (security) gate shall ensure the gate closes behind the vehicle prior to leaving the vicinity of the gate. The vehicle operator shall also ensure no unauthorized vehicles or persons gain access to the airside while the gate is open.
23. Vehicle operators shall not operate vehicles in a reckless or careless manner. A reckless or careless manner is one that intentionally or through negligence threatens the life or safety of any person or threatens damage or destruction to property.
24. Vehicles shall not enter the movement area or cross runways unless the operator of the vehicle has received required training and authorization from the (AIRPORT OPERATOR) to operate on the movement area. Whenever possible, all airport vehicles shall utilize the airport perimeter and service roads to transition between areas on the airport.
25. Each vehicle operator is responsible for the activities of each vehicle passenger on the airside of the airport.

1.7.2. Vehicle Regulations.

1. No vehicle shall be operated on the airside unless it has proper registration in the (STATE) or is a qualified off-road vehicle that is not normally operated on public streets but has received the approval of the (AIRPORT OPERATOR).
2. All vehicles operated on the airside must have vehicle liability insurance, as required by the (AIRPORT OPERATOR).
3. The (AIRPORT OPERATOR) must approve tenant vehicles operated on the movement and non-movement areas. These vehicles must display a (AIRPORT OPERATOR) sticker or an airport-approved company logo that is at least ____ inches (____ cm) in height on the passenger and operator's doors.
4. Carts or pieces of equipment being towed or carried after darkness must have side and rear reflectors or rear lights.
5. No vehicle shall be permitted on the airside unless—
 - a. It is properly marked, as outlined in FAA Advisory Circular 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*.
 - b. It is in sound mechanical condition with unobstructed forward and side vision from the driver's seat.

- c. It has the appropriately rated and inspected fire extinguishers (service vehicles and fuel trucks).
 - d. It has operable headlamps and brake lights.
 - 6. Vehicles operating on the movement area shall be equipped with operating amber rotating beacon or equivalent.
 - 7. All aircraft refueling vehicles and any other vehicle 8-foot or more in width shall be equipped with a flashing amber beacon and flashing front, tail, and clearance lights that are activated at all times when operating on the airside.
- 1.7.3. Vehicular Accidents.** Operators of vehicles involved in an accident on the airport that results in injury to a person or damage to an aircraft, airport property, or another vehicle shall—
- 1. Immediately stop and remain at the scene of the accident.
 - 2. Render reasonable assistance, if capable, to any person injured in the accident.
 - 3. Report the accident immediately to the (AIRPORT OPERATOR) before leaving the scene, if possible.
 - 4. Provide and surrender the following to any responding (AIRPORT OPERATOR) personnel: name and address, airport identification card, state driver's license, and any information such personnel need to complete a motor vehicle accident report.

Section 2. Driving on the Non-Movement Areas

- 2.1.** Non-movement areas include taxiways, aprons, and other areas **not** under control of the ATCT. Anyone authorized to operate a motorized vehicle on the airside may do so on the non-movement areas without being in positive radio contact with the ATCT. These areas include—
- 2.1.1.** Service roads
 - 2.1.2.** Cargo aprons
 - 2.1.3.** General aviation apron
 - 2.1.4.** Air carrier apron(s)
- 2.2. Driving.** Operating within the ramp areas requires the vehicle driver to exercise extreme caution as aircraft are always moving, aircraft passengers may be walking from an aircraft to the gate, and noise levels are high. Vehicle drivers should—
- 2.2.1.** Never drive between safety cones or across delineated passenger walkways.
 - 2.2.2.** Watch cockpit blind spots—pilots typically cannot see behind or below the aircraft.
 - 2.2.3.** Avoid jet blast or prop wash, which can blow debris or overturn vehicles.
 - 2.2.4.** Be aware and avoid moving propellers that can cause damage, injury, or death.
 - 2.2.5.** Be aware of other vehicle movements—you may not hear them approaching due to aircraft engine noise.
 - 2.2.6.** Yield to aircraft, passengers, and emergency vehicles, which ALWAYS have the right-of-way on any portion of the airport.

When traveling on the apron, always use designated vehicle service roads. Driving close to buildings, around vehicles, or aircraft is prohibited. This policy helps to establish a predictable order to vehicle movements in congested areas and helps to ensure their visibility to aircraft and other vehicles.

Parked aircraft may still have their engines running, so be aware of the hazards of jet blast or prop wash, which may overturn vehicles. Before an aircraft engine is started, the aircraft's red flashing beacons must be on. In some instances, propellers and engine spinners are marked to indicate when the engine is operating. A pilot's ability to maneuver quickly on the ground is limited. Propellers and jet engines can cause significant damage and injury to personnel. In addition, cockpit visibility prohibits the pilot from seeing under the nose or behind the aircraft and limits the pilot's ability to avoid ground vehicles.

2.3. Nighttime and Poor Weather Driving Conditions. Poor weather conditions (snow, fog, rain, etc.) might obscure visual cues, roadway markings, and airport signs. Vehicle operators should remain vigilant of their surroundings and operating boundaries. Watch out for snow removal equipment and aircraft operating in the vicinity under low-visibility conditions. There are additional risks present under these conditions.

Section 3. Driving on the Movement Areas

Drivers who are authorized to drive on the movement area require more training and vigilance since there are dangers associated with this area that are not present on non-movement areas. In addition to the principals for driving on the non-movement area, drivers who have access to the movement area must be cognizant of the meaning of airfield signs, markings, and lighting configurations. Additionally, they must be able to communicate with air traffic control (ATC) and be able to follow ATC directions.

3.1. ATCT Control. Movement areas are defined as the runways, taxiways, and other areas of the airport that are used for taxiing, hover taxiing, air taxiing, and takeoff and landing of aircraft, exclusive of loading ramps and aircraft parking areas. Movement areas are considered "positive control," meaning that all vehicle operators will need permission from ATC before entering the area.

3.2. Authorized Vehicles. Only those vehicles necessary for airport operations may enter a movement area. Therefore, fuel trucks, maintenance vehicles, tugs, catering trucks, and other nonessential vehicles should not be permitted to enter these areas. Exceptions may include (AIRPORT OPERATOR)-authorized vehicles with appropriately trained personnel. Airport Operations/Maintenance shall coordinate all other vehicle operations within the movement areas.

3.3. Taxiways.

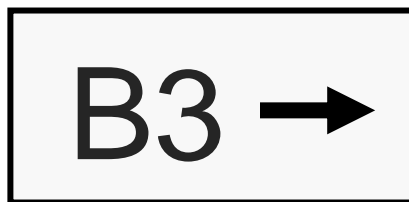
3.3.1. Designations. Aircraft use taxiways to move to and from the aprons and the runways.

Taxiways are designated by letters or by a letter/number combination such as A, B, G2, or B3. (The Airport Operator should include a diagram of the airport here with the taxiway and runway designations.)

3.3.2. Lighting. Taxiways are lighted with **blue** edge lighting and/or reflectors. Some taxiways are also lighted with **green** in-paved, centerline lighting. (*Use airport-specific example here.*)

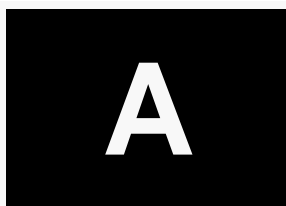
3.3.3. Signs. The signs used on taxiways are direction, destination, location, and taxiway ending marker signs.

Direction and Designation Signs have **black lettering** and a **directional arrow** or **arrows** on a **yellow background**. The arrow indicates the direction to that taxiway, runway, or destination.



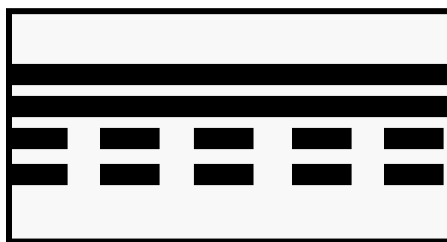
Taxiway Directional Sign

Location Signs have **yellow lettering** on a **black background**. The location sign below indicates that the operator of the vehicle/equipment is located on the named taxiway or runway.



Taxiway Location Sign

Runway Safety Area/Object Free Zone (OFZ) and Runway Approach Area Boundary Signs, when required, identify the boundary of the runway safety area/OFZ or the runway approach area to the pilot and vehicle operator. The driver can use these signs to identify when the vehicle is clear of the runway environment. It has a **black inscription** that depicts the holdline marking on a **yellow background**.



Runway Safety Area/OFZ and Runway Approach Boundary Sign

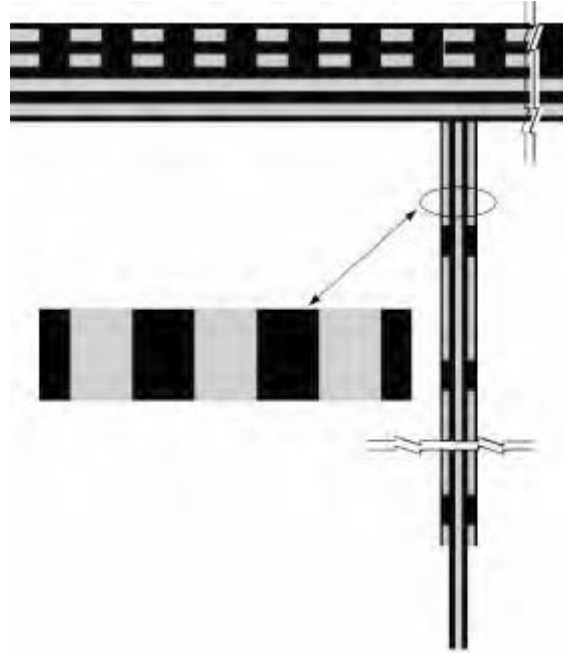
- 3.3.4. Markings.** Pavement markings on taxiways are always **yellow**. The taxiway centerline is painted on all taxiways. On the edges of some taxiways, there is a solid, double yellow line or double-dashed line. If pavements are usable on both sides of the line, the lines will be dashed; if not, the lines will be solid.

Runway Holding Position Markings are located across each taxiway that leads directly onto a runway. These markings are made up of **two solid lines** and **two broken yellow lines** and denote runway holding position markings. These markings are always co-located with a Runway Holding Position Sign. A vehicle operator must not cross from the solid-line side of the marking without first obtaining clearance.



Runway Holding Position Marking

Enhanced Taxiway Centerline Markings may be present at some airports, and will appear before a runway hold line, as illustrated below. These markings are intended to serve as an additional warning to flight crews that they are approaching the runway.



Enhanced Taxiway Centerline Markings

Non-Movement Area Boundary Markings consist of **two yellow lines** (one solid and one dashed). The solid line is located on the non-movement area side, while the dashed yellow line is located on the movement area side. A vehicle operator is not to cross from the solid-line side without first contacting the ATCT and obtaining a clearance to operate on the movement area.



Non-Movement Area Boundary Marking

Instrument Landing System (ILS) Critical Area Holding Position Markings are comprised of **two parallel yellow lines** with lines running perpendicular between the two parallel yellow lines. These markings identify the location on a taxiway where an aircraft or vehicle is to stop when it does not have clearance to enter ILS critical areas. The ILS critical area must remain clear, especially in inclement weather. If a vehicle proceeds past this ILS marking, it might cause a false signal to be transmitted to the landing aircraft.



ILS Hold Position Marking

3.4. Runways (*Use Airport Specific Examples*).

3.4.1. Designations. Runways are areas where aircraft land and take off. Runways are always designated by a number such as 1 or 19. The number indicates the compass heading of the runway. An aircraft taking off on runway 19 is headed 190 degrees. In the event of parallel runways, a letter designation is added to indicate either the right or left runway; e.g., **1L-19R, 1R-19L**.

3.4.2. Lighting. Runways are lighted with a variety of colored lights.

Runway Edge-lights are **white**. **If the runway has an instrument approach**, the last 2,000 feet of the runway will be yellow in color.

Runway Centerline Lights are **white** except for the last 3,000 feet of the runway, where they begin to alternate **red** and **white**. For the last 1,000 feet of runway the centerline lights are all **red**.

Runway Touchdown Zone Lights are **white**.

Runway End/Threshold Lights are split lenses that are **red/green**.

3.4.3. Signs.

Mandatory Holding Position Signs for Runways have **white numbering/lettering** on a **red background with a white border**. These are located at each entrance to a runway and at the edge of the runway safety area/obstacle-free zone and are co-located with runway holding position markings. **Do not proceed beyond these signs until clearance is given by the ATCT to enter onto the runway.**



Runway Hold Sign

Instrument Landing System (ILS) Holding Position Signs have **white letters** on a **red background with a white border**. These signs tell pilots and vehicle operators where to stop to avoid interrupting a type of navigational signal used by landing aircraft. This is a critical area, and a vehicle/equipment operator must remain clear of it (*use airport-specific policy*). If a vehicle proceeds past this microwave landing system/ILS marking, it may cause a false signal to be transmitted to the landing aircraft.



ILS Hold Sign

Holding Position Signs for Runway Approach Areas. The inscription on a sign for a runway approach area is the associated runway designation followed by a dash and the abbreviation APCH for approach. This sign has **white numbering** on a **red background** with a **white border**. The sign is installed on taxiways located in approach areas where an aircraft on a taxiway would either cross through the runway safety area or penetrate the airspace required for the approach or departure runway.



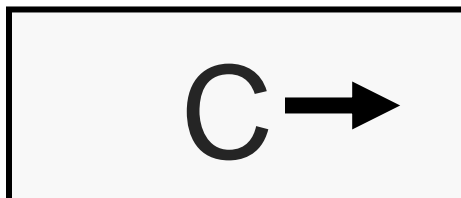
Approach Sign

Runway Distance Remaining Signs provide distance remaining information to pilots during takeoff and landing operations. They have **white numbering** on a **black background**. **The number on the sign provides the remaining runway length in 1,000-foot increments.**



Runway Distance Remaining Signs

Runway Exit Sign is a destination sign located prior to the runway/taxiway intersection on the side and in the direction of the runway where the aircraft is expected to exit. This sign has **black lettering** and a **directional arrow** on a **yellow background**.



Runway Exit Sign

3.4.4. Markings.

Pavement markings on a runway are white. Runway Threshold Markings and Runway Threshold Bars, Runway Aiming Point Markings, Runway Designation Markings, Runway Touchdown Zone Markings, Runway Centerline Markings, Runway Side Stripes, and Displaced Threshold Markings are white. The only nonwhite lines on a runway are yellow lead-in/-off lines that extend from the runway centerline and holdlines for a specific operation known as land and hold short.

Section 4. Communications

4.1. Any vehicle driving on the **movement areas (runways and taxiways)** must be in contact with the ATCT or capable of monitoring and transmitting on the CTAF. Vehicle operators must always monitor the appropriate radio frequency when in the movement areas on controlled airports. Permission must be requested and clearance given prior to driving on a movement area. A vehicle that is equipped with a radio may escort vehicles without radios. When a movement area is closed for construction, vehicles may traverse that area without ATCT contact but must be escorted if their travels require them to cross an active movement area.

4.2. The ATCT controller may use separate or common radio frequency to control all ground traffic, vehicle and aircraft, on the movement areas. The frequency is only to be used to get clearance onto and off the movement areas. When the ATCT is closed, the CTAF should be used to announce a driver's intentions when operating within the movement area.

4.3. Phraseology. Vehicle operators must contact the ATCT ground controller each and every time they proceed onto or leave the movement area. When proceeding onto a movement area, vehicle operators must tell the controller three things: **WHO you are, WHERE you are, and WHAT your intentions are.** Vehicle operators must always acknowledge all communications so ground control and other persons know that the message was received. **Vehicle operators must always give aircraft and ground control transmissions priority unless an emergency exists.** Very high frequency frequencies are for the primary use of aircraft and ATCT personnel. Some typical transmissions are as follows:

- (AIRPORT NAME) ground control, this is Airport 21 at Charlie 6. Request permission to cross Runway 30."
- (AIRPORT NAME) ground control, this is Airport 21 at Taxiway Alpha. Request clearance south on runway 19 right for a light inspection."

Reply transmissions may be brief, such as—

- ATCT: "Airport 21, hold short of runway 19 right."
- Driver: "Airport 21 holding short of runway 19 right."
- ATCT: "Airport 21 cleared south on runway 19 right."
"Please expedite, landing aircraft on a 10 mile final for runway 19 right."
- Driver: "Airport 21 cleared south on runway 19 right, will expedite."
- Driver: "Ground control, Airport 21 is clear of runway 19 right."

NOTE: If you are unsure what the controller has said, or if you don't understand an instruction, you should ask the controller to repeat it. Good communications only occur when each party knows and understands what the other is saying.

4.4. Common Use Phrases.

What Is Said:

What It Means:

Acknowledge

Let me know you have received and understand this message.

Advise Intentions

Let me know what you plan to do.

Affirmative	Yes.
Correction	An error has been made in the transmission, and the correct version follows.
Go Ahead	Proceed with your message only.
Hold/Hold Short	Phrase used during ground operations to keep a vehicle or aircraft within a specified area or at a specified point while awaiting further clearance from air traffic control.
How do you hear me?	Question relating to the quality of the transmission or to determine how well the transmission is being received.
Immediately or without delay	Phrase used by ATC when such action compliance is required to avoid an imminent situation.
Negative	"No" or "permission not granted" or "that is not correct."
Out	The radio conversation is ended, and no response is expected.
Over	My radio transmission is ended, and I expect a response.
Read Back	Repeat my message to me.
Roger	I have received all of your last transmission.
Stand By	Means the controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority. Also means to wait as in "stand by for clearance." The caller should reestablish contact if a delay is lengthy.
Unable	Indicates inability to comply with a specific instruction, request, or clearance.
Verify	Request confirmation of information.
Wilco	I have received your message, understand it, and will comply with it.

4.5. Phonetic Aviation Alphabet. Because some letters have similar sounds, like B and P, the international aviation industry uses the following words to reduce confusion. For example; Taxiway B would be referred to as Taxiway Bravo on the radio.

A	ALFA	N	NOVEMBER
B	BRAVO	O	OSCAR
C	CHARLIE	P	PAPA
D	DELTA	Q	QUEBEC
E	ECHO	R	ROMEO

F	FOX-TROT	S	SIERRA
G	GOLF	T	TANGO
H	HOTEL	U	UNIFORM
I	INDIA	V	VICTOR
J	JULIET	W	WHISKEY
K	KILO	X	X-RAY
L	LIMA	Y	YANKEE
M	MIKE	Z	ZULU

4.6. ATCT Light Gun Signals. Air traffic controllers have a backup system for communicating with aircraft or ground vehicles if their radios stop working. The controller has a light gun in the tower that can send out different colored lights to tell the pilot or driver what to do. If a vehicle operator experiences a radio failure on a runway or taxiway, the operator should vacate the runway as quickly and safely as possible and contact the ATCT by other means, such as a cellular telephone, and advise the ATCT of the situation. If this is not practical, then the driver, after vacating the runway, should turn the vehicle toward the tower and start flashing the vehicle headlights and wait for the controller to signal with the light gun.

Light gun signals, and their meaning, are as follows:

Steady Green	OK to cross runway or taxiway.
Steady Red	STOP!
Flashing Red	Move off the runway or taxiway.
Flashing White	Go back to where you started.
Alternating Red and Green	Use extreme caution.

4.7. Safety. The FAA defines runway incursion as “**Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take off of aircraft.**”

Runway incursions are primarily caused by error in one or more of the following areas:

- Pilot/ground vehicle/controller communications
- Airport familiarity
- Loss of situational awareness

An example of an incursion is a vehicle at an airport with an operating ATCT straying onto a runway in front of an aircraft causing the pilot to take an action to avoid a collision.

When driving on the airfield, vehicle operators need to always be aware of their location and the meaning of all pavement markings, lights, and signs. When on the aprons and taxiways, stay away and steer clear of aircraft. **Aircraft always have the right-of-way.**

NOTE: Any individual involved in a runway incursion should receive remedial airfield driver’s training given by the (AIRPORT OPERATOR).

This is an appropriate place to describe an individual airport's runway and taxiway identification system. In addition to the system description, the FAA recommends that the airport operator provide a runway (RY) and taxiway (TWY) diagram, especially if the airport's identification system varies from the norm or is otherwise complicated.

SAMPLE

GROUND VEHICLE OPERATING FAMILIARIZATION PROGRAM TRAINING RECORD

Employee's Name: _____

Employee's Position: _____

Company Name: _____

Social Security Number: _____

Driver's License State and Number: _____

Driver's License Expiration Date: _____

I agree to abide by all rules and regulations prescribed for the operations of a vehicle within the airport operations area.

As of this time, I certify that I hold a current and valid driver's license. If for any reason my license becomes invalid, I will notify the (AIRPORT OPERATOR) immediately.

Sign your name and indicate today's date below:

(NAME)

(DATE)

● ● PERMITTED VEHICLE OPERATING AREAS

Location

- ☐ General Aviation Ramp
- ☐ Air Carrier/Terminal Ramp
- ☐ Firehouse
- ☐ Air Cargo
- ☐ Tie-downs
- ☐ General Aviation Hangars
- ☐ All Areas

I certify that the above named individual has satisfactorily completed the Driver Training Program.

Instructor's Signature: _____

22. CONSTRUCTION MANAGEMENT PLAN.

At the Pre-construction Conference, the Contractor will be given copies of the Construction Management Plan for this Project which will identify the various individuals along with their authority and responsibilities for quality control. That document will detail the measures and procedures to be followed to comply with the Quality Control Provision of the Construction Contract, including, but not limited to the quality control and acceptance tests required by the Project Specifications. The following pages include the Acceptance Testing Checklist and the forms which shall be used by the Contractor and the Independent Testing Laboratory to report test results to the Engineer. The checklist and forms will also be included in the Construction Management Plan when it is prepared for this Project.

23. STORMWATER DISCHARGE PERMIT.

The Contractor shall secure and maintain a General Permit for Storm Water Discharges from Construction Sites for this project in accordance with Section 402(p) of the Federal Clean Water Act and Section 405 of the Federal Water Quality Act of 1987. A Notice of Intent shall be filed by the Contractor.

EPA Stormwater Notice Processing Center
Mail Code 4203M
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Copies of the Notice of Intent requirements and required forms are enclosed in the following pages for the use of the Contractor. Electronic filing is available through the EPA website at: <http://cfpub1.epa.gov/npdes/stormwater/cgp.cfm>.

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**This table is provided for the Contractors convenience only.
The Technical Specifications dictate exact requirements for acceptance and payment.**

ACCEPTANCE TESTING CHECKLIST (See Specifications For Details)			
MATERIAL	TEST(S) REQUIRED	FREQUENCY REQUIRED	FREQUENCY CONDUCTED
Special-601 Crack Sealing	Vendor's Certified Test Report	Once per Shipment	
P-152 Excavation & Embankment	Cohesive subgrade 95%, noncohesive subgrade 100% of max. density as determined by ASTM 698 \pm 2% of optimum moisture. Field testing by ASTM D2922	One per 1,000 C.Y. per lift for Embankments. One per 1,000 S.Y. for top of subgrade	
	16' straight edge 1/2" maximum deviation and 0.05' max. from plan grade for subgrade	As directed	
P-154 Subbase Course	Liquid Limit ≤ 25 , $PI \leq 6$ ASTM D4318 100% of max. density as determined by ASTM D698 or AASHTO T 99-74	Density on basis of one per 1,000 S.Y. per Lift,	
	16' Straight edge 1/2" max. deviation	As Directed	
	Thickness within 1/2" of plan thickness	One per 500 S.Y.	
	Gradations as per spec.	Gradation on basis of one per 1,000 C.Y. and minimum of one per each day of placement	
P-401 Plant Mix Bituminous Pavement (Aggregate)	Flat/Elongated Pieces $\leq 8\%$ ASTM D4791	Mix Design	
	Fractured Faces 70% with two, 85% with one for 75 Blow	Mix Design	
	LA Abrasion Wear $\leq 40\%$ ASTM C131	Mix Design	
	Sodium Sulfate Loss $\leq 10\%$ Magnesium Sulfate Loss $\leq 13\%$ ASTM C88	Mix Design	
	Sand Equivalent value ≥ 45 ASTM D2419	Mix Design	
	Liquid Limit ≤ 25 , P.I. ≤ 6 , ASTM D4318	Mix Design	
P-401 Plant Mix Bituminous Pavement (Bituminous Material)	Vendor's Certified Test Reports.	Once per Tankload	
P-401 Plant Mix Bituminous Pavement (Mix Design)	Marshall Mix Design Asphalt Institute's Manual Series No. 2 (MS-2), current edition and Project Specifications	Once if approved (Must be submitted to & approved by the Engineer & FAA before any paving begins on project)	
P-401 Plant Mix Bituminous Pavement (Test Section)	All Tests required for Bituminous Pavement	Once per paving project or as required by Engineer	
P-401 Plant Mix Bituminous Pavement (Acceptance Tests and measurements)	See Specifications for Stability, Flow, Air Voids, Mat Density, Joint Density, Thickness, Smoothness, Grade.	Lot is one day's production, not to exceed 2,000 Tons, divided into 4 equal Sublots	
P-401 Plant Mix Bituminous Pavement (Moisture Susceptibility)	Tensile Strength Ratio ≥ 75 per ASTM D4867	Mix Design	
P-401 Plant Mix Bituminous Pavement (Smoothness and Grade)	Surface test with 16' straight edge, survey on 50' grid.	Lot is each day of production	
P-602 Bituminous Prime Coat	Vendor's Certified Test Report	Once per Tankload	
P-603 Bituminous Tack Coat	Vendor's Certified Test Report	Once per Tankload	
P-608 Emulsified Asphalt Seal Coat	Vendor's Certified Test Report	Once per Tankload	

**This table is provided for the Contractors convenience only.
The Technical Specifications dictate exact requirements for acceptance and payment.**

ACCEPTANCE TESTING CHECKLIST (see specifications for details)			
<i>MATERIAL</i>	<i>TEST(S) REQUIRED</i>	<i>FREQUENCY REQUIRED</i>	<i>FREQUENCY CONDUCTED</i>
<i>P-610 Structural Portland Cement Concrete</i>	<i>28 Day Strength 4,000 psi min., Slump ≤ 4" Air Content 5% ± 1 Vendor's Certificate for Cement.</i>	<i>Once per Pour or 50 C.Y.</i>	
<i>P-620 Runway and Taxiway Painting</i>	<i>Manufacturer's Certifications</i>	<i>Once per Shipment</i>	
<i>D-701 Pipe for Storm Drains and Culverts</i>	<i>Manufacturer's Certifications & Backfill Compaction.</i>	<i>Once per shipment & as per P-152</i>	
<i>D-705 Underdrain</i>	<i>Manufacturer's Certifications, Porous Backfill Gradation & Backfill Compaction.</i>	<i>Once per shipment & as directed, P-152</i>	
<i>T-901 Seeding</i>	<i>Vendor's Certification of Seed and Mulch Mix</i>	<i>Once per shipment</i>	
<i>L-108 Airport Underground Power Cable for Airports</i>	<i>FAA AC 150/5345-53C FAA AC150/5345-7E FAA AC 150/5345-26C Manufacturer's Certification System Megger as per L-108</i>	<i>Once per Shipment and as directed</i>	
<i>L-110 Airport Underground Electrical Duct Banks and Conduits</i>	<i>P-610 for Concrete, Manufacturer's Certification for Conduits, Backfill Compaction</i>	<i>Once per Shipment and as directed</i>	
<i>L-125 Airport Lighting Systems, Guidance Signs and Edge Markers</i>	<i>FAA AC 150/5345-53C Listed FAA AC 150/5340-30D FAA AC 150/5345-39C FAA AC 150/5345-42F FAA AC 150/5345-44H FAA AC 150/5345-46C FAA 150/534—47B Manufacturer's Certifications, & P-610 for Concrete.</i>	<i>Once per Shipment and as directed</i>	

[illegible]

<h2 style="margin: 0;">P-152, P-154 COMPACTION ACCEPTANCE TESTS SUMMARY</h2> <p style="margin: 5px 0 0 0;">PROJECT: Four Corners Regional Airport</p> <p style="margin: 5px 0 0 0;">AIP No.: 3-35-0016-039-2016</p>

<h2 style="margin: 0;">P-152, P-154 COMPACTION ACCEPTANCE TESTS SUMMARY</h2> <p style="margin: 5px 0 0 0;">PROJECT: Four Corners Regional Airport</p> <p style="margin: 5px 0 0 0;">AIP No.: 3-35-0016-039-2016</p>

<h2 style="margin: 0;">P-152, P-154 COMPACTION ACCEPTANCE TESTS SUMMARY</h2> <p style="margin: 5px 0 0 0;">PROJECT: Four Corners Regional Airport</p> <p style="margin: 5px 0 0 0;">AIP No.: 3-35-0016-039-2016</p>

[illegible]

NOTE: Retests must be identified and cross - referenced to original failed test.

<h2 style="margin: 0;">P-154 GRADATION SUMMARY - ACCEPTANCE TESTS</h2> <p style="margin: 5px 0 0 0;">PROJECT: Four Corners Regional Airport</p> <p style="margin: 0 0 0 0;">AIP No.: 3-35-0016-039-2016</p>

AIP No.: 3-35-0016-039-2016

[illegible]

P-401 BITUMINOUS PAVEMENT (75 BLOW)
ACCEPTANCE TESTS

Project: Four Corners Regional Airport							Paving Date:			
AIP No: 3-35-0016-039-2016							Test Lab:			
Max. Theoretical Density Lot Ave (PCF):							Tester:			
Marshall Density Lot Ave (PCF):				VMA Lot Ave:			Lot Tonnage:			
Lot Number	Sublot	Stability lbs.	Flow .01 inch	Air Voids %	Mat Density PCF	Mat Density %	Joint Density PCF	Joint Density %	Core Thickness inches	
									Mat	Joint
1	A									
	B									
	C									
	D									
	E									
	F									
	G									
	H									
	Lot Average X									
	Sn									
	L	1800	8	2.0		96.3		93.3		
	U		16	5.0						
	QL									
	QU									
	PWL									

$QL = (X-L) / Sn$
 $QU = (U-X) / Sn$
 $Sn = \text{Sample standard deviation} = [(d1^2 + d2^2 + d3^2 + \dots + dn^2)/n-1]^{1/2}$
 $d1, d2, \dots = \text{Deviations of the individual sample values from the average value } X$
 $X = \text{Sample average of all subplot values within a lot}$
 $n = \text{Number of sublots}$
 PWL from Table 1 in General Conditions Section 110

Remarks:

P-401 BITUMINOUS PAVEMENT - GRADE ACCEPTANCE TESTS

Airport Project: Four Corners Regional Airport **Date:** _____
AIP Number: 3-35-0016-039-2016 **Tester:** _____
Lot Number: _____ **Lot Size:** _____

Lot Location Limits: _____

Test Interval - Measure elevations with a level from a known benchmark every 50' longitudinally and transversely. Measurements are to be taken daily to assure construction agrees with plan elevations within the 1/2" tolerance. The Contractor shall submit all pertinent survey notes with this completed form. No single shot may exceed 3/4" or more from the planned grade.

1 Lot = 2,000 Square Yards Tolerance = $\pm 1/2"$ or $\pm 0.042'$

#	Location STA: or N	Offset or E	Planned Elevation	Measured Elevation	Deviation	
					Plus	Minus
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
22						
23						
24						
25						
50						

Calculate Percent of Tests Exceeding Tolerance

E = Exceeds Tolerance > 1/2" deviation from plan elevation.

of E Measurements _____ x 100 = **Percent Exceeding Tolerance**
 Total # of Measurements

of E Measurements = _____ x 100 = **#### P.E.T.** _____
 Total # of Measurements = _____ Signature Licensed Surveyor

P-401 BITUMINOUS PAVEMENT SMOOTHNESS ACCEPTANCE TESTS

Airport Project:	Four Corners Regional Airport
AIP Number:	3-35-0016-039-2016
Lot Number:	
Lot Location Limits:	

Date: _____
Tester: _____
Lot Size: _____

Test Interval - Measure every 50' using a 16' straightedge. Read both parallel and perpendicular to the direction of paving. Measurements are to be taken daily and the procedure witnessed by the Resident Inspector. Measure and record all deviations "E" which exceed 1/4" and all acceptable measurements "A".

[illegible]

Calculate Percent of Tests Exceeding Tolerance

E = Exceeds Tolerance > 1/4" deviation from plan elevation.

$$\frac{\text{\# of E Measurements}}{\text{Total \# of Measurements}} \times 100 = \text{Percent Exceeding Tolerance}$$

_____ x 100 = _____ P.E.T.

P-401 BITUMINOUS PAVEMENT

QUALITY CONTROL TESTS

PROJECT: Four Corners Regional Airport					SAMPLE DATE:	
AIP No: 3-35-0016-039-2016					TEST LAB:	
LOCATION:			TONS:		TESTER:	
Lot Number 1	Sublot Test Results				Action Limit	Suspension Limit
	A	B	C	D		
Asphalt Content %					JMF \pm 0.45% =	JMF \pm 0.70% =
Gradation						
% Passing 3/4 inch					0 100	0 100
% Passing 1/2 inch					JMF \pm 6% =	JMF \pm 9% =
% Passing 3/8 inch					JMF \pm 6% =	JMF \pm 9% =
% Passing No. 4					JMF \pm 6% =	JMF \pm 9% =
% Passing No. 8					JMF \pm 5% =	JMF \pm 7.5% =
% Passing No. 16					JMF \pm 5% =	JMF \pm 7.5% =
% Passing No. 30					JMF \pm 3% =	JMF \pm 4.5% =
% Passing No. 50					JMF \pm 3% =	JMF \pm 4.5% =
% Passing No. 100					JMF \pm 2% =	JMF \pm 3% =
% Passing No. 200					JMF \pm 2% =	JMF \pm 3% =
Test Property	Test Results				Specification Limits	
Moisture Content of Aggregate					—	
Moisture Content of Mixture					0.5% Maximum	
Temperature of Dryer					350° F Maximum temperature of aggregate	
Temperature of Bitumen in Tank					325° F Maximum temperature	
Mix Temperature at Plant					—	
Mix Temperature at Paver					250° F Minimum	
In Place Density						
Location						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

P-401 - ACCEPTANCE TEST SUMMARY

AIRPORT: Four Corners Regional Airport				COUNTY: San Juan		STATE: NM		Page: 1 of ____	
AIP NO: 3-35-0016-039-2016				ACCEPTANCE TEST		CONTROL TEST			
Unit Price			Marshall Air Voids (%)	Mat Density (%)	Marshall Unit Wt (PCF)	VMA %	Stability (lbs)	Flow (.01 in)	Joint Density (%)
Mix	/Ton								
AC	/Ton								
Specification			2.0 - 5.0	Target: 98%		_____ min	1800 min	8 - 16	Target: 96%
DATE:		Lot							
LOT:	1	Ave							
LOCATION:	Test Section	Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							
DATE:		Lot							
LOT:	2	Ave							
LOCATION:		Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							
DATE:		Lot							
LOT:	3	Ave							
LOCATION:		Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							

P-401 - ACCEPTANCE TEST SUMMARY

AIRPORT: Four Corners Regional Airport				COUNTY: San Juan		STATE: NM		Page: 2 of ____	
AIP NO: 3-35-0016-039-2016				ACCEPTANCE TEST		CONTROL TEST			
Unit Price			Marshall Air Voids (%)	Mat Density (%)	Marshall Unit Wt (PCF)	VMA %	Stability (lbs)	Flow (.01 in)	Joint Density (%)
Mix		/Ton							
AC		/Ton							
Specification			2.0 - 5.0	Target: 98%		_____ min	1800 min	8 - 16	Target: 96%
DATE:		Lot							
LOT:	4	Ave							
LOCATION:		Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							
DATE:		Lot							
LOT:	5	Ave							
LOCATION:		Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							
DATE:		Lot							
LOT:	6	Ave							
LOCATION:		Std							
LIFT:		Dev							
% PAY:		QU							
TONS MIX:		QL							
TON AC:									
TOTAL PAY:		PWL							

P-610 STRUCTURAL PORTLAND CEMENT CONCRETE ACCEPTANCE TESTS

PROJECT: Four Corners Regional Airport		SAMPLE TIME & DATE:
AIP No: 3-35-0016-039-2016		TEST LAB:
LOCATION:	SAMPLE @ cu. yds.	TESTER:

FIELD TESTS

Concrete Supplier:	Truck Number:	Ticket Number:
Mix No.		
Slump: inches		
Entrained Air: %		
Unit Weight: PCF		
Water Added: Gallons		
Concrete Temp: °F		
Air Temp: °F		
Time in Mixer: Minutes		

COMPRESSIVE STRENGTH TESTS

	Compressive Strength Required: 4,000 psi @ 28 days		
Test Property	7 Days	28 Days	
		Sample 1	Sample 2
Break Date:			
Break Type:			
Cross-Section Area: inches ²			
Unit Weight: PCF			
Total Load: lbs.			
Unit Stress: psi			

Break Type: a. Cone, b. Cone and Split, c. Cone and Shear, d. Shear, e. Columnar

Remarks:



Approximate
site location

Four Corners Regional Airport

Farmington

Bloomfield Hwy

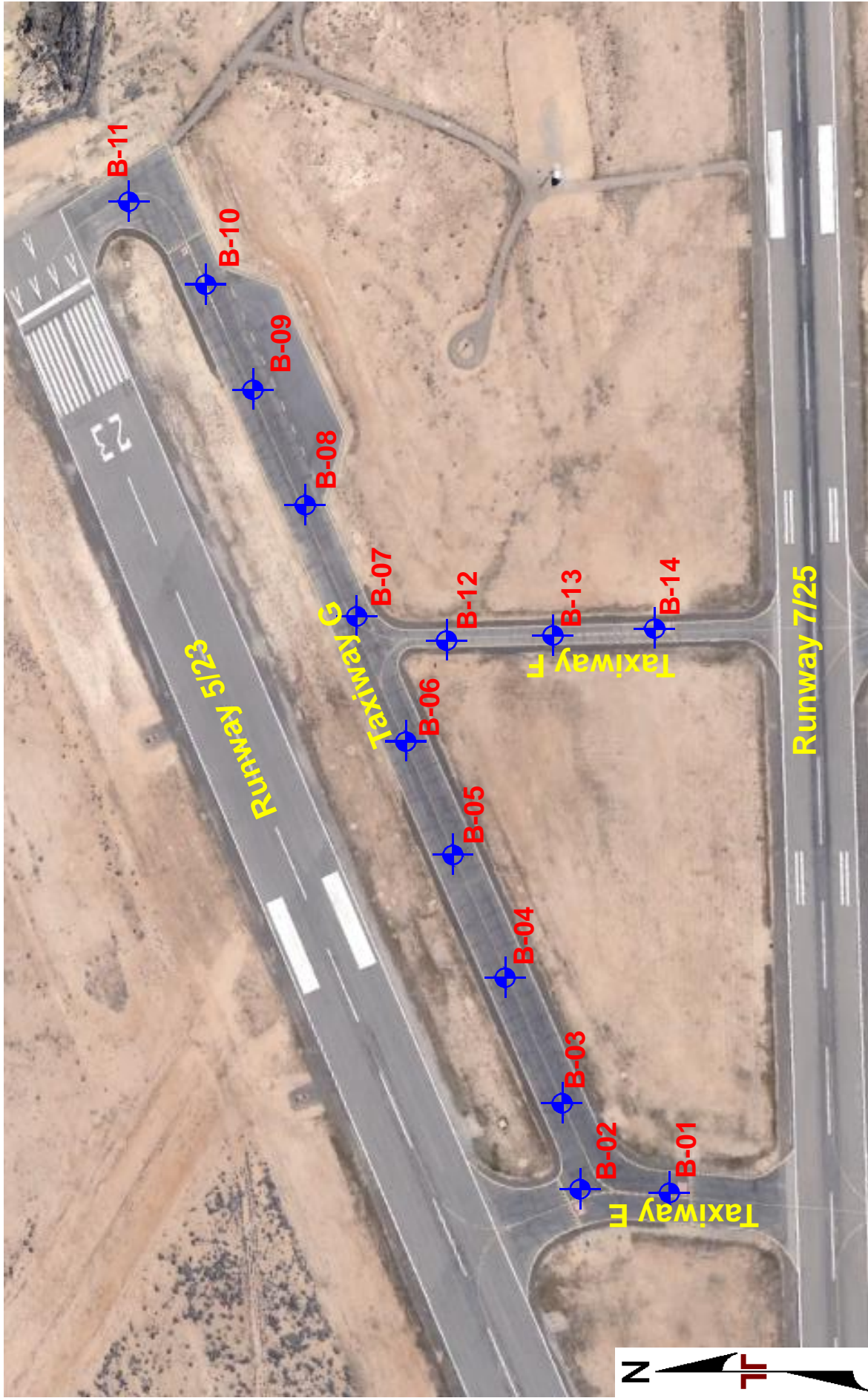
itland



SOURCE: Google Earth.

DIAGRAM IS FOR GENERAL LOCATION
ONLY, AND IS NOT INTENDED FOR
CONSTRUCTION PURPOSES

<div>Project Manager:</div> <div>Drawn by:</div> <div>Checked by:</div> <div>Approved by:</div>	<div>69155009</div> <div>ZCS</div> <div>ZCS</div> <div>MEA</div> <div>ZCS</div>	<div>Scale:</div> <div>File Name:</div> <div>Date:</div> <div>N.T.S.</div> <div>69155009A-1</div> <div>4/23/2015</div>
<div>SITE LOCATION MAP</div>	<div>Taxiways E, F, & G Improvements</div> <div>Four Corners Regional Airport</div> <div>Farmington, New Mexico</div>	
<div>Terracon</div> <div>Consulting Engineers & Scientists</div> <div>#4A CR 3499</div> <div>Flora Vista, New Mexico 87415</div> <div>PH: (505) 334-3400</div> <div>FAX: (505) 334-3703</div>	<div>Exhibit</div> <div>A-1</div>	



Approximate boring location

BORING LOCATION PLAN		Exhibit
Taxiways E, F, & G Improvements Four Corners Regional Airport Farmington, New Mexico		A-2
 Consulting Engineers & Scientists		44 CR 3489 PH. (505) 334-2900 Flora Vista, New Mexico 87115 FAX. (505) 334-9703
Project Manager:	69155009	Project No.
Drawn by:	ZCS	Scale: N.T.S.
Checked by:	MEA	File Name: 69155009A-2
Approved by:	ZCS	Date: 4/23/2015

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

BORING LOG NO. B-01

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74202° Longitude: -108.22638° Station: 58+25 Offset: 400' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.5 6 inches Asphalt Pavement								
	1.4 11 inches of Aggregate Base Course , light brown, medium dense								
	LEAN CLAY WITH SAND (CL) , brown, stiff to very stiff				16-10-10	6	135		41
					12-10-17	15	113		71
					10-8-9	17	112		88
	5.0 SANDY LEAN CLAY (CL) , brown, stiff	5			6-9-9	14	112		62
	8.0 POORLY GRADED GRAVEL WITH SAND (GP) , light brown to green, very dense								
	10.5 Auger Refusal at 10.5 Feet	10			50/5"	4	121		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/27/2015

Boring Completed: 3/27/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15










BORING LOG NO. B-02

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74243° Longitude: -108.22641° Station: 59+00 Offset: 200' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
DEPTH									
	0.5 6 inches Asphalt Pavement	5							
	1.4 11 inches of Aggregate Base Course , light brown, medium dense								
	SANDY LEAN CLAY to CLAYEY SAND (SC) (CL) , brown, very stiff				10-10-16	5	134		21
					9-16-23	14	119	29-18-11	49
						11	116		
					7-11-13	17			
	5.0 LEAN CLAY WITH SAND (CL) , brown, stiff				6-9-9	16	113		79
	7.5 POORLY GRADED GRAVEL WITH SAND (GP) , light brown to green, very dense	10							
					27-31-50/2"	1			
	12.5 Auger Refusal at 12.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Borings backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS	 #4A CR 3499 Flora Vista, New Mexico	Boring Started: 3/27/2015	Boring Completed: 3/27/2015
<i>Not Encountered</i>		Drill Rig: CME-75	Driller: Kyvek
		Project No.: 69155009	Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15

BORING LOG NO. B-03

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.7424° Longitude: -108.2261° Station: 60+00 Offset: 250' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.4 5.25 inches Asphalt Pavement								
	13 inches of Aggregate Base Course , light brown, medium dense								
	1.5 SANDY LEAN CLAY (CL) , brown, very stiff to hard				19-12-15	13	123		68
					12-14-14	14	121		60
					9-10-10	15	112		64
	6.0 POORLY GRADED GRAVEL WITH CLAY AND SAND (GP) , light brown, dense				9-15-31 N=46	20			
	6.5 Boring Terminated at 6.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/27/2015

Boring Completed: 3/27/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-5

BORING LOG NO. B-04

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74266° Longitude: -108.22549° Station: 62+00 Offset: 250' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.4 5 inches Asphalt Pavement								
	1.4 12 inches of Aggregate Base Course , light brown								
	3.5 LEAN CLAY (CL) , with sand, brown, stiff				10-8-9	14	119		86
	7.0 CLAYEY SAND (SC) , trace gravel, light brown to brown, medium dense	5			9-8-12	19	114		49
	8.7 POORLY GRADED GRAVEL WITH SAND (GP) , light brown to white, very dense				13-12-16	10	113		36
	Auger Refusal at 8.67 Feet								
					42-50/1"	4	113		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/27/2015

Boring Completed: 3/27/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-6

BORING LOG NO. B-05

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES	
	GPS coordinates +/- 15 feet of actual location	Latitude: 36.74289° Longitude: -108.22491°							LL-PL-PI		
	Station: 64+00 Offset: 250' RT										
	DEPTH										
	0.4	4.5 inches Asphalt Pavement	5								
		12 inches of Aggregate Base Course , light brown, medium dense									
	1.4	SANDY LEAN CLAY (CL) , trace gravel, brown, stiff to very stiff				17-13-7	2			10	
						12-8-8	22	100		59	
						7-7-8	12	107			
						5-9-14	25			67	
	6.5	Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).	Notes:	
Abandonment Method: Borings backfilled with soil cuttings upon completion.	See Appendix C for explanation of symbols and abbreviations.		
WATER LEVEL OBSERVATIONS	 <p>#4A CR 3499 Flora Vista, New Mexico</p>	Boring Started: 3/27/2015	Boring Completed: 3/27/2015
<i>Not Encountered</i>		Drill Rig: CME-75	Driller: Kyvek
		Project No.: 69155009	Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15

BORING LOG NO. B-06

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74314° Longitude: -108.22427° Station: 66+00 Offset: 250' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	DEPTH								
	0.4 4.75 inches Asphalt Pavement								
	11 inches of Aggregate Base Course , light brown, medium dense								
	1.3								
	SANDY LEAN CLAY (CL) , brown, stiff to very stiff				13-11-10	2	108		22
					10-8-9	15	108		51
						17		27-13-14	58
					6-12-12				
		5							
					5-7-24	20 2	98		60
	7.0								
	7.5 POORLY GRADED GRAVEL WITH SAND (GP) , light brown to white, very dense				22-42-31 N=73				
	Auger Refusal at 7.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).	Notes:	
Abandonment Method: Borings backfilled with soil cuttings upon completion.	See Appendix C for explanation of symbols and abbreviations.		
WATER LEVEL OBSERVATIONS	 #4A CR 3499 Flora Vista, New Mexico	Boring Started: 3/26/2015	Boring Completed: 3/26/2015
<i>Not Encountered</i>		Drill Rig: CME-75	Driller: Kyvek
		Project No.: 69155009	Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15






BORING LOG NO. B-07

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PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION	GPS coordinates +/- 15 feet of actual location	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	Latitude: 36.74336° Longitude: -108.22363°	Station: 68+00 Offset: 250' RT							LL-PL-PI	
	DEPTH									
	0.5 6 inches Asphalt Pavement		5							
	1.8 15 inches of Aggregate Base Course , light brown, medium dense					14-10-13	15	115		43
	3.5 CLAYEY SAND (SC) , with gravel, light brown, medium dense					13-13-14	11	114		32
	5.0 SANDY LEAN CLAY (CL) , trace gravel, light brown, very stiff					6-8-13	18	109		55
	6.5 POORLY GRADED GRAVEL WITH SAND (GP) , light brown, very dense					20-27-49 N=76	5			
	Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/26/2015

Boring Completed: 3/26/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-9

BORING LOG NO. B-08

Page 1 of 1

PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.7436° Longitude: -108.22302° Station: 70+00 Offset: 250' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	DEPTH								
	0.5 6.5 inches Asphalt Pavement								
	0.5 9.5 inches of Aggregate Base Course , light brown, medium dense								
	1.3 CLAYEY SAND (SC) , with gravel, light brown, dense to very dense				7-13-48	2	104		20
	2.5 CLAYEY SAND WITH GRAVEL (SC) , light brown, very dense				31-50/5"	8 4	127		44 18
	3.8 Auger Refusal at 3.75 Feet				24-50/3"				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/26/2015

Boring Completed: 3/26/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-10

BORING LOG NO. B-09

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PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74385° Longitude: -108.22238° Station: 72+00 Offset: 250' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.5 5.5 inches Asphalt Pavement								
	10.5 inches of Aggregate Base Course , light brown, medium dense								
	1.5								
	SANDY LEAN CLAY (CL) , light brown, very stiff				13-13-18	8	109		14
					12-15-18	14	112		51
					12-14-16	6			
	5.0	5			7-10-11	9	102		39
	CLAYEY SAND (SC) , light brown, medium dense								
	6.5								
	Boring Terminated at 6.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/26/2015

Boring Completed: 3/26/2015

Drill Rig: CME-75

Driller: Kyvek

Project No.: 69155009

Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15

BORING LOG NO. B-11

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PROJECT: Taxiways E, F, & G Improvements

CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.7444° Longitude: -108.22126° Station: 75+90 Offset: 200' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	7.5 inches Asphalt Pavement	0.6							
	7.5 inches of Aggregate Base Course , light brown, loose	1.3							
	SANDY LEAN CLAY to LEAN CLAY WITH SAND (CL) , light brown to brown, stiff to very stiff				10-11-5	4	122		13
					9-15-14	15 5	105	28-18-10	75 59
	CLAYEY SAND (SC) , trace gravel, light brown, loose to medium dense				6-8-11	18	109		40
					2-4-8 N=12	18			
					4-4-4 N=8	22			
	POORLY GRADED GRAVEL WITH SAND (GP) , light brown, very dense								
					29-26-33 N=59	4			
	Auger Refusal at 11.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Not Encountered

Terracon
#4A CR 3499
Flora Vista, New Mexico

Boring Started: 3/26/2015

Drill Rig: CME-75

Project No.: 69155009

Boring Completed: 3/26/2015

Driller: Kyvek

Exhibit: A-13

BORING LOG NO. B-12

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PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74288° Longitude: -108.22367° Station: 67+20 Offset: 280' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.4 5 inches Asphalt Pavement								
	16 inches of Aggregate Base Course , light brown, medium dense								
	1.8 CLAYEY SAND (SC) , with gravel, light brown, medium dense				11-15-17	4	110		15
	3.5 CLAYEY SAND WITH GRAVEL (SC) , light brown, medium dense				11-14-11	6	117		17
	4.5 POORLY GRADED GRAVEL WITH SAND (GP) , light brown, medium dense				8-14-31	26	90		23
	6.0 Auger Refusal at 6 Feet	5			13-13	11			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:
Abandonment Method: Borings backfilled with soil cuttings upon completion.		
WATER LEVEL OBSERVATIONS	 #4A CR 3499 Flora Vista, New Mexico	Boring Started: 3/26/2015
<i>Not Encountered</i>		Boring Completed: 3/26/2015
		Drill Rig: CME-75
		Driller: Kyvek
		Project No.: 69155009
		Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15

BORING LOG NO. B-13

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PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74237° Longitude: -108.22363° Station: 66+50 Offset: 565' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.5 5.5 inches Asphalt Pavement								
	1.7 14.5 inches of Aggregate Base Course , light brown, medium dense				11-12-12	4	113		10
	3.5 SANDY LEAN CLAY TO LEAN CLAY WITH SAND (CL) , trace gravel, light brown, stiff				13-10-7	5	126		60
	4.5 CLAYEY SAND WITH GRAVEL (SC) , light brown, very dense				5-13-50/4"	20	97		24
	6.3 POORLY GRADED GRAVEL WITH SAND (GP) , light brown, very dense	5			27-45-50/4"	1			
	Boring Terminated at 6.33 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).	Notes:	
Abandonment Method: Borings backfilled with soil cuttings upon completion.	See Appendix C for explanation of symbols and abbreviations.		
WATER LEVEL OBSERVATIONS	 <p>#4A CR 3499 Flora Vista, New Mexico</p>	Boring Started: 3/26/2015	Boring Completed: 3/26/2015
<i>Not Encountered</i>		Drill Rig: CME-75	Driller: Kyvek
		Project No.: 69155009	Exhibit: A-15

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15

BORING LOG NO. B-14

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PROJECT: Taxiways E, F, & G Improvements


CLIENT: Armstrong Consultants, INC.
Grand Junction, CO

SITE: Four Corners Regional Airport
Farmington, New Mexico

GRAPHIC LOG	LOCATION GPS coordinates +/- 15 feet of actual location Latitude: 36.74203° Longitude: -108.22369° Station: 65+65 Offset: 740' RT	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
								LL-PL-PI	
	DEPTH								
	0.3 4 inches Asphalt Pavement								
	18 inches of Aggregate Base Course , light brown, medium dense								
	1.8				12-13-9	3	112		9
	SANDY LEAN CLAY (CL) , trace gravel, light brown, very stiff								
	3.5				7-8-11	12	108	29-18-11	65
	CLAYEY SAND (SC) , with gravel, light brown, medium dense to dense								
	6.0				5-7-22	15 4			41
	POORLY GRADED GRAVEL WITH SAND (GP) , light brown, very dense								
	7.3				10-19-42	12	98		32
	Auger Refusal at 7.3 Feet				28-35-50/4"	4			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: Hollow Stem Auger	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:
Abandonment Method: Borings backfilled with soil cuttings upon completion.		
WATER LEVEL OBSERVATIONS	 #4A CR 3499 Flora Vista, New Mexico	Boring Started: 3/26/2015
<i>Not Encountered</i>		Boring Completed: 3/26/2015
		Drill Rig: CME-75
		Driller: Kyvek
		Project No.: 69155009
		Exhibit: A-16

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 69155009.GPJ TERRACON2012.GDT 4/24/15